How to make healthy food more attractive: The expected effect of language and food type on purchase intention and expected reward

Bachelor Thesis
Yuan Druijff
Radboud University
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Supervisor: Dr. Laura Speed
Abstract
Living a healthy lifestyle is important for many but making healthy food choices remains difficult. Language plays an important role in food choice, because people’s intuition that unhealthy food is tastier than healthy food is mediated through language and communication (Raghunathan et al., 2006). The goal of this study was to research whether there was an effect of different language use on the expected reward and purchase intention of food. Previous research found that different types of language (healthy, neutral, indulgent) on food labels and menus affected food choice, and the current study investigated if this finding could be extended to a social media advertisement setting. An online questionnaire was conducted where participants were shown one of the three sets of six advertisements for six different meals: three healthy meals and three unhealthy meals. Each meal received either an indulgently framed, healthily framed, or neutrally framed description. There were no effects of language on either purchase intention or expected reward. Desire for unhealthy food was higher than for healthy food, but the amount participants were willing to spend on a meal was higher for healthy food compared to unhealthy food. There was also a positive correlation between expected reward and purchase intention. The expected reward increased when the purchase intention increased. This study does not provide evidence that language affects the purchase intention or expected reward of healthy food on Instagram.
**Introduction**

Living a healthy lifestyle is an important goal for many nowadays. One essential aspect of such a lifestyle is food choice. However, much of the food that people like to consume is unhealthy (i.e. high in fats and sugars, but low in vitamins and nutrients). Simultaneously, due to the digitalisation and automatization of many physical activities and manual labour, people are moving less than in the past. Therefore, many are struggling to make healthy choices. The amount of people who are overweight nowadays reflects this struggle: half of the Dutch citizens (50.2%) aged 18 years or older were mildly or seriously overweight in 2018 (Zantinge & van der Wilk, 2019). In 1990 this amount was ‘only’ 35.1% of citizens (Plasmans, 2019). Choosing to make healthy eating decisions, therefore, seems to be more difficult than expected.

A reason for this perceived difficulty is the intuition that unhealthy food is tastier than healthy food. Research found that the less healthy a food was portrayed to be, the tastier the food was perceived to be (Raghunathan, Naylor, & Hoyer, 2006). The enjoyment of unhealthy foods was also higher during consumption compared to healthy foods. So, instinct makes us like unhealthy food more than healthy food, but how did we acquire this intuition? Internal and external factors appear to play a role. Internally there seems to be a sharp contrast between ‘nutritious’ and ‘healthy’ things, and ‘pleasant’ and ‘appealing’ things (Raghunathan et al., 2006). Something nutritious is thus difficult to also be seen as appealing. External factors that play an important role in developing this intuition include media and personal communication, because people are exposed to content that confirms this intuition through these channels (Raghunathan et al., 2006). External communication about food can thus create and support perceptual links between food and expected tastiness. For example, through the regular support of the unhealthy = tasty intuition in the language and design of advertisements in media such as television and magazines. These perceptual links, in turn, can affect people’s food choices.

Many internal and external motivations can thus be ascribed to people’s food choices, for instance food cravings. Food cravings are defined as: ‘a motivational state whereby an individual feels compelled to seek and ingest a particular food’ (Tiggeman & Kemps, 2005). The Australian participants in that study indicated they most often craved chocolate (24.3%), take-away foods (e.g. McDonalds, pizza) (22.6%), and meals (e.g. roast lamb and vegetables) (21%), so primarily unhealthy foods. It was, however, unclear what food belonged to each category. Pizza, for example, can also be seen as a meal. Food cravings were also linked to strong mental imagery where participants imagined eating the food in question and, for
example, indicated that they could not think of anything else than eating it while having this food craving (Tiggeman & Kemps, 2005). The vividness of this mental image played an important role in the craving intensity, since vividness is related to apprehending the food and envisioning the taste. A strong, vivid image of a food during a food craving thus focuses primarily on the taste of the food in question and makes it very difficult to think about anything else than eating the food. The vivid image of tasting the food created by a food craving also explains why the most craved foods are unhealthy when one takes the unhealthy = tasty intuition (Raghunathan et al., 2006) into account, where unhealthy food is seen as inherently tastier compared to healthy food. This intuition can also explain how food cravings have been linked to multiple health issues in other studies such as obesity (Tiggeman & Kemps, 2005). Mental imagery, such as that during food cravings, are thus important to take into account when thinking about what motivates one’s food choices.

Mental images, such as the ones triggered during food cravings, are representations of food in the mind and might explain certain food choices. These conceptual representations evoked by food can also affect our purchasing behaviour (Papies, 2013). It has been proposed that attractive foods are more likely to trigger eating simulations (i.e. mental simulations triggered by a food item, for example food taste and texture, eating situations, and hedonic satisfaction) when thinking about food. This is explained by the typical association of unhealthy food with a rewarding experience. Papies (2013) measured eating simulations with a feature listing task where participants were asked to list at least five typical properties for sixteen concepts, including eight foods. The listed features were coded in different categories such as taste, hedonic features, health features, and (non) eating situations. Participants listed far more features in categories related to eating simulations for unhealthy food than neutral food. An eating simulation is thus more likely to occur for unhealthy food, which in turn leads to a prediction of higher reward. Expected reward was also related to food preference in other previous research: a high reward was correlated with sweet and fatty foods (Davis et al., 2006). Therefore, the conceptual representations of and expected reward from unhealthy foods may be different from that of healthy foods.

Expected reward is relevant because (unhealthy) food is considered inherently rewarding, while something like e.g. money is taught to be rewarding (Naish, MacKillop, & Balodis, 2018). Moreover, unhealthy foods are associated in our mind with taste and a high reward (e.g. Papies, 2013; Raghunathan et al., 2006). This can explain the general preference and desire for unhealthy food and clarify the influence of this preference and desire on buying behaviour. Desire is defined as ‘the conscious or unconscious state of motivation for a
specific stimulus or experience that is anticipated to be rewarding’, and this desire is often stronger for short-term hedonic goals (Papies, Barsalou, & Rusz, in press). Simultaneously, unhealthy food has frequently been described with indulgent language mainly focused on pleasure. This type of language use reinforces the previous unhealthy = tasty intuition (Raghunathan et al., 2006) where unhealthy food is linked to hedonic experiences. Using indulgent language to describe healthy food may consequently increase the expected reward and desire. The hedonic focus on taste and pleasure might make the expected reward for eating the food higher since the food is made more desirable by triggering mental simulations of the food with language.

An explanation for this could lie in the grounded cognition theory of desire investigated by Papies et al. (in press). This theory suggests that appetitive cues established by previous experiences with the food unconsciously influence the expected reward and purchase intention. When choosing a meal at a restaurant, for example, a decision is generally made based on previous experiences eating at that specific restaurant or previous experiences eating the dishes the restaurant offers. So, a previous positive experience with the food leads to a higher desire. This is because the best outcome in the respective situation is determined by the mental representations triggered by previous (positive) experiences with the food (Higgs, 2016). A positive mental image can be triggered by external cues related to the food, such as language. An eating simulation triggered by language use is similar to the expectancy of what a particular food will taste like, because the hedonic and sensory properties of a food will be simulated (Papies, in press). A higher desire can thus be related to food choice and purchase intention, because the expected reward from eating the food will be higher. This high desire is triggered by mental simulations based on previous experiences and memories that are stored and activated in, amongst other areas, the orbitofrontal cortex and the amygdala (e.g. Kringelbach, 2005, LeDoux, 2007).

The orbitofrontal cortex in the brain links (food) rewards to hedonic experiences (Kringelbach, 2005). It houses the expected reward from the taste, olfactory and somato-sensory components of a food (Kringelbach, 2005). Rewards are thus connected to pleasure or displeasure and are calculated in this part of the brain. The orbitofrontal cortex also communicates with other brain regions such as the amygdala, which is one of the areas in the brain that stores (LeDoux, 2007) and processes emotions (Kringelbach, 2005) related to, amongst others, food (LeDoux, 2007). Research found that the amygdala’s activity responded to different language framing (health focused or taste focused) on food labels (Grabenhorst, Schulte, Maderwald, & Brand; 2013). The taste label caused stronger activity in the
amygdala compared to a health focused label due to higher expected pleasantness (Grabenhorst et al., 2013). So, a taste focused label causes a stronger emotional response than a health focused label. Because this emotional response in the amygdala is linked to the reward value of the taste of food in the orbitofrontal cortex, it is possible that language can affect the expected reward for eating food. However, these studies did not look at the potential effect of language on the expected reward from eating food. If the expected reward for healthy food can be higher with an indulgently framed message, it can increase the desire for and therefore purchase intention of healthy food. One easy way through which language can be manipulated in this way is the language on food labels.

Food labels and descriptions are important to look at in the context of purchase intention of food because they are one of the most widely distributed text messages one comes across on this planet (Cook, 2009). Labels are one of the first things that are looked at before buying a product and the content might therefore affect food choice, especially since food labels are an important gauge for measuring healthiness and attractiveness for customers (Borgmeier & Westenhoefer, 2009). Simultaneously, indulgence and taste are the most important factors on which people base their food choices (Turnwald, Jurafsky, Conner, & Crum 2017; Turnwald & Crum, 2019). The content of this food label is therefore important to investigate to see what effect it has on food choice and thus also purchase intention. Research found that food labelling with different frames in a cafeteria setting affected consumers’ choice (Turnwald, Boles, & Crum; 2017). A food label using indulgent language (e.g. ‘Dynamite chili and tangy lime-seasoned beets’) for vegetables lead to more participants choosing the vegetable option, compared to a neutrally (e.g. ‘Beets’) or healthily framed food label (e.g. ‘Lighter-choice beets with no added sugar’). Using indulgent language thus made food more attractive compared to a neutral or health focused description since it was focused on taste. However, research found that healthy food labels usually focus on health attributes (Turnwald & Crum, 2019) and this can therefore make healthy food less appealing compared to unhealthy food. Additionally, for consumers mainly focused on the tastiness of food, a health-focused label can make the food more unattractive since the perceived tastiness is even more important to them than potential health risks (Lähteenmäki et al., 2010; Liem, Toraman Aydin, & Zandstra, 2012). Using indulgent and taste-focused language on food labels for healthy food can thus make healthy food more attractive and consequently increase the purchase intention compared to a health focused or neutral food label. However, language manipulation on an unhealthy food label might influence desire for that unhealthy food less compared to manipulation of language on a healthy food label. This is due to unhealthy food
automatically being seen as more attractive (e.g. Raghunathan et al., 2006; Naish et al., 2018) compared to healthy food. Hence, seeing something related to an unhealthy food may already trigger a high desire and/or purchase intention, which makes the language manipulation less strong.

So, according to earlier research (e.g. Liem et al., 2012; Turnwald et al., 2017; Turnwald & Crum, 2019) language on food labels is expected to have an effect on purchase intention, because it can trigger certain mental images which makes food more attractive (e.g. Papies, 2013; Gräbner et al., 2013). These previous studies, however, only looked at food packaging or descriptions of food in various settings. While these areas are all relevant and important to look at, food advertising is another influential area to focus on because one is enticed to choose a certain food by ‘someone else’s sweet words’ (Cook, 2009). In advertisements, these ‘sweet words’ are used to actively try to persuade someone to perform an action, namely going somewhere and buying the food in question. This suggests that food choices are not only based on food itself, but that language and communication, whether by a person or an advertisement, also play a role. That is why the current study will look at food advertisements.

The two most frequently used claims in food advertising are taste and nutrition claims (Kim, Cheong, & Zheng; 2009). So, food advertising also uses indulgence and health frames. Within the field of food marketing, children have been a target audience because they are easy to influence. This does raise ethical concerns since it has a negative effect on children's eating habits (Thaichon & Quach, 2016). Research found that fast food advertisements on social media affected children’s purchase intention (Thaichon & Quach, 2009). The effect of social media advertisements has not yet been researched in adults, but food advertisements on social media could influence buying behaviour. If healthy foods would be advertised on social media with indulgent language, it might affect purchase intention; seeing that using indulgent language to describe food can make the food seem more attractive (Turnwald et al., 2017, Turnwald & Crum, 2019). Social media might, therefore, be a good place to promote healthy eating through e.g. advertisements. Additionally, social and new media are becoming an increasingly more relevant means of advertising products and can play a role in changing people’s buying behaviour like traditional advertising does. Companies are investing time and money in maintaining multiple social media channels such as Instagram, Facebook, YouTube, and Twitter. Many posts can be found relating to food on all platforms. It is therefore important to see if the findings on influencing food choice also apply to social media, where many are exposed to food. Language about food on social media has been
researched to some extent in for example Fried, Surdeanu, Kobourov, Hingle, and Bell (2014) where the researchers looked at tweets containing food language and what population characteristics predictions can be derived from that language. However, the effect of advertising language on the purchase intention of the food was not measured in the mentioned studies.

In the current research one main underlying factor may determine food choice, which is the unhealthy = tasty intuition (Raghunathan, 2006). This intuition is important since it can explain why unhealthy food is related to taste (Papies, 2013) and a high reward (Davis et al., 2006) in our minds. Language on food labels and in food advertising seem to be important ways of developing and confirming this intuition and the conceptual links formed because of it (Turnwald et al., 2017). Generally, unhealthy food is seen as more attractive, and it seems that language is one of the ways through which this view is maintained. It is important to see whether using similar (indulgent) language for healthy food can change the intention to buy, since changing language on food labels and in food advertisements can be an easy way to persuade people to make healthier choices. No research was found on the impact of using different language in food advertisements on purchase intention, even though it is important to research since it might convince people to make healthier food choices. That is why the present study will investigate language in food advertisements. Moreover, it is important to investigate whether a food advertisement on social media can affect food choice, since research suggests that advertisements on social media affect buying behaviour (Thaichon & Quach, 2016). Social media is presently also one of the most used platforms for advertising and its popularity has only risen in the last 15 years, with Instagram being one of the fastest-growing platforms (Ortiz-Ospina, 2019). A survey indicated that 80% of the participants claim that they use Instagram to decide whether to buy a product or a service (Facebook, 2019). However, no research was found on the topic of the effect of language in either social media or Instagram advertisements on purchase intention or expected reward which is why the present study will explore these research gaps by researching the following research questions and hypotheses:

Main RQ: To what extent is there an effect of different types of language (indulgent, neutral, health framing) on the purchase intention and the expected reward of different food types (healthy, unhealthy) in an advertisement on Instagram?
H1: Purchase intention will be higher for meals advertised with an indulgent frame compared to a neutral or healthy framed description.

H2: Language framing will have a weaker effect on purchase intention of unhealthy food since unhealthy food is inherently seen as highly rewarding.

H3: Indulgence framing triggers a higher expected reward than healthy and neutral framing, regardless of the food type.

RQ2: To what extent is there a relationship between expected reward and purchase intention?

H4: Expected reward is positively correlated with purchase intention.
Methodology

Materials

Multiple Instagram advertisements were created for six different foods. The manipulated words in the advertisements’ description was based on words used in a study on healthy menu item descriptions versus standard menu item descriptions conducted by Turnwald et al. (2017). Indulgent framing was based on words most likely to occur on a standard menu, neutral framing was based on words that did not differ between a healthy or standard menu, and healthy framing was based on words that were more likely to occur on a healthy menu. To avoid word repetition, synonyms were used. To account for the limitation of unmatched sentence length in Turnwald, Boles, and Crum (2017), the descriptions were all of similar length, using similar sentence structures. The only difference being the adjectives used to describe the food across the different label conditions.

Meals with a mix of takeaway foods (because some of these can be considered a meal on its own) were chosen to be used in the advertisements because these were two of the highest craved food items and the two most common favourite imagined foods (Tiggeman and Kemps, 2005). Three healthy meals (salad, vegetable curry, grilled salmon) and three unhealthy meals (pizza, hamburger, nachos) were chosen to be depicted in advertisements for a fictional restaurant on Instagram. These meals were chosen intuitively by five researchers as generally healthy and unhealthy. For all six foods, a healthily, indulgently, and neutrally framed description was made. One framing of each food was then included in one of three versions of the questionnaire, of which one version was shown to each participant.

An example of an indulgence framed description for salad was: ‘Sappige salade met krokante falafel, nu beschikbaar op onze menukaart’ (translation: ‘Juicy salad with crispy falafel, now available on our menu’). The healthy framed description of salad was: ‘Koolhydraatarme salade met vezelrijke falafel, nu beschikbaar op onze menukaart’ (translation: ‘Low-carb salad with high fibre falafel, now available on our menu’). The neutral framed description of salad was: ‘Rauwkost salade met kikkererwten falafel, nu beschikbaar op onze menukaart’ (translation: ‘Coleslaw salad with chickpea falafel, now available on our menu’). The sentence ‘Nu beschikbaar op onze menukaart’ (translation: ‘Now available on our menu’), and other similar sentences, were added to make the advertisements more credible and similar to a real Instagram advertisement. The same type of sentence with slight variations were used in every advertisement to make sure the different sentences did not have an effect on the purchase intention due to a difference in focus (i.e. ‘Taste this now in our restaurant!’ focuses too much on taste and would therefore only be
applicable to a taste focused label). The Instagram advertisements and questionnaire were in Dutch to not let communicating in a second language potentially impact the results. All the Instagram advertisements with descriptions can be found in Appendix B.

Subjects
In total 192 Dutch participants took part in the questionnaire. One participant was deleted from the data file because they indicated they were 17 years old. In total, 52.4% of participants were female. Out of all the participants 55.5% were students, 40.3% were working, and 4.2% indicated they were doing something else at the moment. Out of the students, more than half (52.8%) were doing a bachelor at a university, 32.1% were doing a bachelor at a university of applied sciences, 7.5% were doing vocational education, and 4.7% were still in high school. Out of the working participants, 53% completed a bachelor’s/master’s degree at a university or university of applied sciences, 23.5% completed their vocational education, 21.1% completed their high school education, and 2.4% indicated other. The age of the participants ranged from 18 to 69 years old ($M = 29.52$). Participants’ mean hunger level was 3.57 (1 = low, 7 = high). Out of all participants, 35.6% saw Version 1, 31.4% saw Version 2, and 33% saw Version 3. Gender ($\chi^2 (2) = 3.57, p = .168$), educational status ($\chi^2 (2) = 4.36, p = .359$), age ($F (2,188) < 1$), and hunger level ($F (2,188) < 1$) were all distributed evenly across all questionnaires. Around one third (37%) of the participants had eaten one of the meals pictured in the questionnaire in the past seven days.

Design
The independent variables were language framing and type of food. Therefore, a 3 (indulgence, neutral, healthy framing) x 2 (healthy or unhealthy foods) within-subjects design was used. Participants were exposed to all conditions, but not to every item in each condition. The three conditions for each food (healthy, neutral, indulgence framing) were distributed across three versions of the questionnaire. These questionnaires all included three healthy meals and three unhealthy meals with three different framings. Each meal had a different framing across the three questionnaires.

Instruments
The dependent variables expected reward and purchase intention were measured through a questionnaire. Purchase intention was defined as: ‘The willingness of a customer to buy a certain product or service’ (MBASkool, 2019). In this case willingness to purchase a meal.
To measure purchase intention participants were asked to give their opinion on a statement on a seven point semantic differential scale with the following bipolar adjectives: ‘waarschijnlijk-onwaarschijnlijk’ (translation: ‘probable-improbable’), ‘aannemelijk-onaanexemelijk’ (translation: ‘likely-unlikely), and ‘mogelijk-onmogelijk’ (translation: ‘possible-impossible’) based on Prendergast, Tsang, and Chan (2010). The statement was: ‘Ik zou deze maaltijd kiezen in een restaurant’ (translation: ‘I would choose this meal in a restaurant’).

Expected reward was defined as: ‘The momentary value of a food to the individual at the time of ingestion’ (Rogers & Hardman, 2015). To measure expected reward, two questions were asked. Firstly, the desire to eat the food was measured with the following question based on Rogers & Hardman (2015): ‘Hoe sterk is uw verlangen om deze maaltijd te eten, dat wil zeggen, proeven, kauwen en doorslikken, op dit moment?’ (translation: ‘How strong is your desire to eat this meal, that is, to taste, chew and swallow, right now?’). This was measured on a seven-point semantic differential scale with the anchors ‘helemaal niet sterk’ (translation: not strong at all) on the left and ‘extreem sterk’ (translation: ‘extremely strong’) on the right. Secondly, a question on the amount people were willing to pay for the meal was asked (Brunstrom & Rogers, 2009): ‘Stelt u zich voor dat u deze maaltijd zou bestellen in een restaurant. Wat is het maximale bedrag dat u voor deze maaltijd zou willen betalen?’ (translation: ‘Imagine you are ordering this meal in a restaurant. What is the maximum amount you would pay for this meal?’). Participants could fill in the amount in as an open answer.

Various background variables were measured to see if there were individual differences in participants that could interact with the independent variables. The background variables include hunger level and if participants ate one of the meals in the past seven days. The credibility and persuasiveness of the advertisement were included as control variables to make sure these aspects would not affect the design. All variables were measured with one question. Hunger level, credibility, and persuasiveness were measured on a seven-point Likert scale. For credibility and persuasiveness, participants were asked to answer the statement: ‘Ik vind deze advertentie overtuigend/geloofwaardig’ (translation: ‘I find this advertisement persuasive/credible’) on a scale from ‘helemaal mee oneens’ (translation: ‘completely disagree’) to ‘helemaal mee eens’ (translation: ‘completely agree’). Participants’ hunger level was measured with the question ‘Hoeveel trek heeft u op dit moment?’ (translation: ‘How much appetite do you have at the moment?’) on a scale of ‘helemaal geen
trek’ (translation: ‘no appetite at all’) to ‘veel trek’ (translation: ‘a lot of appetite’). Various demographic variables were also measured i.e. age, gender, and educational level.

Procedure
Participants were recruited through convenience sampling via personal connections. The questionnaire was held online through the programme Qualtrics. There was no reward for the participants who finished the questionnaire. Before the survey started there was a short explanation of who the researchers were and what the purpose of the questionnaire was. Participants were also informed about giving their consent for their answers to be used in this study. The next step was to answer questions about educational status, gender, age, how hungry they were at the moment, and about when they ate their last meal. After that, participants saw a fake explanation of the experiment. It mentioned that a restaurant wanted to know which meals they should offer on the menu and which meals were the most attractive to potential customers. This was done to make the advertisements seem more realistic, and to make sure that the participants did not let the goal of the experiment influence their answers. Subsequently, the participants saw a version of the questionnaire and answered questions about the credibility and persuasiveness of the advertisement, purchase intention, and the expected reward. After seeing all the advertisements, the participants were asked if they had eaten any of the meals in the previous seven days. If participants had eaten one of the meals in the past seven days, it might make the meal less attractive to buy regardless of language framing. Finally, participants were debriefed on the actual purpose of the study. All participants received the same questions and procedure. The questionnaire took 32.49 minutes on average (SD = 169.99).
Results

The purpose of this study was to see whether the type of food and the language framing a participant was shown had an effect on the purchase intention and the expected reward from eating the meal. In the second version of the questionnaire for salmon with a neutrally framed description, the scales were accidentally turned around in the questionnaire. The answers were recoded by four coders in SPSS before the following analyses were done.

Three separate two-way repeated measures ANOVAs were used to test the effect of language framing and food type on purchase intention and the two expected reward measures (desire, amount willing to spend on a meal). A Pearson’s r correlation test was done to determine if expected reward and purchase intention were correlated. Two other separate two-way repeated measures ANOVAs were conducted to see whether food type and language framing affected persuasiveness and/or credibility. Two individual two-way repeated measures ANCOVAs were executed to test the possible effect of hunger level and whether the person had eaten one of the meals previously on the independent variables. Dependent samples t-tests were conducted to interpret potential interaction effects.

The reliability of purchase intention comprising three items was good: $\alpha > .939$ for all purchase intention scales across all advertisements in all questionnaires. Consequently, the mean of the three items was used to calculate the compound variable purchase intention for each advertisement the participants saw in every questionnaire. These were then combined and averaged to create compound variables of purchase intention per condition (i.e. healthy food with healthy language framing, unhealthy food with neutral framing, etc.). The means of both expected reward measures, persuasiveness, credibility, and hunger level per participant were also calculated.

There was no significant main effect of food type ($F(1,190)=3.87, p = .051, \eta^2_p = .020$), or language framing ($F(2,380) = 2.87, p = .058, \eta^2_p = .015$) on the purchase intention, but Table 1 shows that numerically the purchase intention was higher for unhealthy food ($M = 4.45, SE = .089$) than healthy food ($M = 4.19, SE = .094$) and for an indulgent framing ($M = 4.42, SE = .092$) compared to healthy framing ($M = 4.38, SE = .090$) and neutral framing ($M = 4.17, SE = .089$). There was no interaction effect ($F(2,380) < 1, \eta^2_p = .002$).

Table 1: Means and standard error for the effect of purchase intention on food type and language framing (1=low value, 7=high value).

<table>
<thead>
<tr>
<th>Food type</th>
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<tbody>
<tr>
<td>Healthy</td>
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</table>

<table>
<thead>
<tr>
<th>Language framing</th>
<th>M</th>
<th>SE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthy</td>
<td>4.31</td>
<td>.132</td>
</tr>
</tbody>
</table>
Two separate repeated measures ANOVAs were conducted for the effect of language framing and food type on the expected reward (ER1 = desire, ER2 = amount willing to spend on a meal). These showed a significant main effect of food type on desire ($F(1,190) = 15.52, \ p < .001, \ \eta^2_p = .076$) but no effect of language framing ($F(2,380) = 2.4, \ p = .092, \ \eta^2_p = .012$) and no significant interaction between language framing and food type ($F(2,380) = 1.18, \ p = .308, \ \eta^2_p = .006$). Table 2 shows that the desire for unhealthy food ($M = 3.97, \ SE = .109$) was higher than for healthy food ($M = 3.53, \ SE = .104$).

There was also a significant main effect of food type on the amount participants were willing to spend on a meal ($F(1,184) = 5.09, \ p = .025, \ \eta^2_p = .027$) but not in function of language framing ($F(2,368) < 1, \ \eta^2_p = .005$). The interaction effect was not significant ($F(2,368) < 1, \ \eta^2_p = .005$). Table 3 shows that participants were willing to spend more on healthy food ($M = 14.67, \ SE = 2.240$) than unhealthy food ($M = 9.63, \ SE = 0.211$).

**Table 2:** Means and standard error for the effect of food type and language framing on the desire to eat the food (ER1) (1=low value, 7=high value).

<table>
<thead>
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<th>Food type</th>
<th>Language framing</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Healthy</td>
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<td>3.64</td>
<td>.138</td>
</tr>
<tr>
<td></td>
<td>Neutral</td>
<td>3.37</td>
<td>.133</td>
</tr>
<tr>
<td></td>
<td>Indulgent</td>
<td>3.57</td>
<td>.135</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>3.53</td>
<td>.104</td>
</tr>
<tr>
<td>Unhealthy</td>
<td>Healthy</td>
<td>3.90</td>
<td>.132</td>
</tr>
<tr>
<td></td>
<td>Neutral</td>
<td>3.90</td>
<td>.131</td>
</tr>
</tbody>
</table>
Table 3: Means and standard error for the effect of food type and language framing on the amount willing to spend on a meal in euros (ER2).

<table>
<thead>
<tr>
<th>Food type</th>
<th>Language framing</th>
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<th>SE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthy</td>
<td>Healthy</td>
<td>19.06</td>
<td>6.700</td>
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<tr>
<td></td>
<td>Neutral</td>
<td>12.29</td>
<td>0.351</td>
</tr>
<tr>
<td></td>
<td>Indulgent</td>
<td>12.64</td>
<td>0.345</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>14.67</td>
<td>2.240</td>
</tr>
<tr>
<td>Unhealthy</td>
<td>Healthy</td>
<td>9.59</td>
<td>0.253</td>
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<tr>
<td></td>
<td>Neutral</td>
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<td>Indulgent</td>
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<tr>
<td></td>
<td>Total</td>
<td>9.63</td>
<td>0.211</td>
</tr>
<tr>
<td>Total</td>
<td>Healthy</td>
<td>14.33</td>
<td>3.360</td>
</tr>
<tr>
<td></td>
<td>Neutral</td>
<td>10.99</td>
<td>0.253</td>
</tr>
<tr>
<td></td>
<td>Indulgent</td>
<td>11.12</td>
<td>0.272</td>
</tr>
</tbody>
</table>

A significant correlation was found between purchase intention and desire (ER1) \((r(191) = .65, p < .001)\). The desire to consume the meal increased when the purchase intention increased. No significant correlation was found between purchase intention and the amount a participant was willing to spend on a meal (ER2) \((r(191) = -.08, p < .292)\).

Food type had a significant effect on the credibility of the advertisement \((F(1,190) = 46.58, p < .001, \eta^2_p = .197)\), while language framing did not \((F(2,380) = 2.56, p = .078, \eta^2_p = .013)\). The interaction effect between food type and language was also significant \((F(2,380) = 6.29, p = .002, \eta^2_p = .032)\). There were no differences between the different language framings of healthy food descriptions (all \(p\)-values > .265), but there were significant differences between the different descriptions of unhealthy food. Table 4 shows that an advertisement for unhealthy food with a healthy description \((M = 4.44, SE = .121)\) received a lower credibility...
evaluation than advertisements with a neutral description ($p = .004$, Bonferroni correction; $M = 4.92, SE = .108$) or advertisements with an indulgent description ($p = .022$, Bonferroni correction; $M = 4.91, SE = .114$). No difference was found between a neutral and indulgent description ($p = 1.000$, Bonferroni correction).

**Table 4:** Means and standard error for the effect of food type and language framing on the credibility (1 = low, 7 = high).

<table>
<thead>
<tr>
<th>Food type</th>
<th>Language framing</th>
<th>M</th>
<th>SE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthy</td>
<td>Healthy</td>
<td>5.31</td>
<td>.085</td>
</tr>
<tr>
<td></td>
<td>Neutral</td>
<td>5.14</td>
<td>.091</td>
</tr>
<tr>
<td></td>
<td>Indulgent</td>
<td>5.25</td>
<td>.096</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>5.03</td>
<td>.072</td>
</tr>
<tr>
<td>Unhealthy</td>
<td>Healthy</td>
<td>4.44</td>
<td>.121</td>
</tr>
<tr>
<td></td>
<td>Neutral</td>
<td>4.92</td>
<td>.108</td>
</tr>
<tr>
<td></td>
<td>Indulgent</td>
<td>4.91</td>
<td>.114</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>4.81</td>
<td>.076</td>
</tr>
<tr>
<td>Total</td>
<td>Healthy</td>
<td>4.80</td>
<td>.080</td>
</tr>
<tr>
<td></td>
<td>Neutral</td>
<td>4.89</td>
<td>.084</td>
</tr>
<tr>
<td></td>
<td>Indulgent</td>
<td>5.06</td>
<td>.079</td>
</tr>
</tbody>
</table>

There were also significant main effects of food type ($F(1,190) = 6.97, p = .009, \eta^2_p = .035$) and language framing ($F(2,380) = 4.23, p = .015, \eta^2_p = .022$) on the persuasiveness of the advertisement. The interaction effect between food type and framing was also significant ($F(2,380) = 5.79, p = .003, \eta^2_p = .030$). No difference was found between the different language framing in the healthy food advertisements (all $p$-values > .444). Table 5 shows that a healthily framed advertisement for unhealthy food ($M = 4.52, SE = .115$) was significantly evaluated lower on persuasiveness than a neutrally framed advertisement ($p = .037$, Bonferroni correction; $M = 4.86, SE = .109$) and a indulgently framed advertisement ($p < .001$, Bonferroni correction; $M = 5.04, SE = .103$). There was no difference between an advertisement for unhealthy food with neutral framing or indulgent framing ($p = .566$, Bonferroni correction).
Table 5: Means and standard error for the effect of food type and language framing on persuasiveness (1 = low, 7 = high).

<table>
<thead>
<tr>
<th>Food type</th>
<th>Language framing</th>
<th>M</th>
<th>SE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthy</td>
<td>Healthy</td>
<td>5.08</td>
<td>.093</td>
</tr>
<tr>
<td></td>
<td>Neutral</td>
<td>4.93</td>
<td>.101</td>
</tr>
<tr>
<td></td>
<td>Indulgent</td>
<td>5.08</td>
<td>.100</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>5.03</td>
<td>.072</td>
</tr>
<tr>
<td>Unhealthy</td>
<td>Healthy</td>
<td>4.52</td>
<td>.115</td>
</tr>
<tr>
<td></td>
<td>Neutral</td>
<td>4.86</td>
<td>.109</td>
</tr>
<tr>
<td></td>
<td>Indulgent</td>
<td>5.04</td>
<td>.103</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>4.81</td>
<td>.076</td>
</tr>
<tr>
<td>Total</td>
<td>Healthy</td>
<td>4.80</td>
<td>.080</td>
</tr>
<tr>
<td></td>
<td>Neutral</td>
<td>4.89</td>
<td>.084</td>
</tr>
<tr>
<td></td>
<td>Indulgent</td>
<td>5.06</td>
<td>.079</td>
</tr>
</tbody>
</table>

There were no significant main effects of food type ($F(1, 189) = 1.11, p=.293, \eta^2_p = .006$) and framing ($F(2, 378) < 1, \eta^2_p = .001$) on purchase intention, whilst controlling for hunger level. There were also no significant interaction effects between framing and hunger level ($F(2, 378) < 1, \eta^2_p = .005$), food type and framing ($F(2, 378) = 1.25, p = .288, \eta^2_p = .007$), and food type, framing, and hunger level ($F(2, 378) < 1, \eta^2_p = .005$). However, there was a significant interaction effect between food type and hunger level ($F(1, 189) = 4.28, p = .040, \eta^2_p = .022$). A low hunger level did not have an effect on the purchase intention ($t(80) = 0.01, p = .994$), but a high hunger level did have an effect ($t(109) = 2.58, p = .011$). Table 6 shows that when hungry, the purchase intention was higher for unhealthy food ($M = 4.68, SD = 1.19$) than for healthy food ($M = 4.23, SD = 1.30$).

Table 6: Means, standard deviations, and $n$ for the effect of food type on purchase intention, while controlling for hunger level (1 = low, 7 = high)

<table>
<thead>
<tr>
<th>Food Type</th>
<th>M</th>
<th>SD</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthy</td>
<td>4.23</td>
<td>1.30</td>
<td>110</td>
</tr>
<tr>
<td>Unhealthy</td>
<td>4.68</td>
<td>1.19</td>
<td>110</td>
</tr>
</tbody>
</table>
No significant main effects of food type and framing on either desire or amount willing to spend on a meal were found whilst controlling for hunger level. Additionally, no interaction effects were found (all $p$-values > .060, see Appendix C). There were also no significant main effects of food type and framing on either purchase intention or amount willing to spend on a meal whilst controlling for whether participants had eaten one of the shown meals in the past seven days. No significant interaction effects were found (all $p$-values > .053, see Appendix C).

However, a significant main effect of food type ($F(1, 189) = 6.96, p = .009, \eta^2_p = .036$) but not of framing ($F(2, 378) < 1, \eta^2_p < .001$) on desire was found whilst controlling for whether participants had eaten one of the shown meals in the past seven days. Table 7 shows that unhealthy food ($M = 3.97, SE = .109$) led to more desire than healthy food ($M = 3.53, SE = .104$). There were no significant interaction effects (all $p$-values > .115, see Appendix C).

**Table 7:** Means and standard deviations for the effect of food type on desire, while controlling for whether participants had eaten one of the shown meals in the past seven days (1 = low, 7 = high)

<table>
<thead>
<tr>
<th>Food Type</th>
<th>M</th>
<th>SE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthy</td>
<td>3.53</td>
<td>.104</td>
</tr>
<tr>
<td>Unhealthy</td>
<td>3.97</td>
<td>.109</td>
</tr>
</tbody>
</table>
Conclusion

The current study set out to examine the effect of food type and language framing on one’s purchase intention and expected reward (RQ1). Furthermore, this study investigated the relationship between expected reward and purchase intention (RQ2). The results revealed there was no difference between the framing of each message (healthy, neutral, indulgence) for purchase intention and expected reward. No difference was found between food types for purchase intention, but there was a difference for expected reward. The desire for unhealthy food was higher, but the amount participants were willing to spend was higher for healthy food. Moreover, a positive correlation between purchase intention and expected reward was found. Desire increased and the amount willing to spend increased slightly when purchase intention increased.
Discussion

Looking at the results, none of the proposed hypotheses have been confirmed. This is because there were no effects for language manipulation, while all hypotheses expected effects for language manipulation. Previous research, however, did find that healthy food described with language similar to that being used to describe unhealthy food (indulgence framing) had an effect on food choice (e.g. Liem et al., 2012; Turnwald et al., 2017). People were more likely to prefer food described with indulgent language compared to neutral or health focused language. Furthermore, taste-focused language was expected to create eating simulations which would in turn guide behaviour and expected reward (Papies et al., in press).

Because the theoretical framework for this study was based on language, the influence of visual elements was not taken into account. This could, however, be a possible explanation of the results. On Instagram the first thing one will see when an advertisement is encountered is the picture since it is more prominent than the text. When seeing a picture advertisement with text, people tend to spend a longer time focusing on the picture part of the advertisement instead of the text part (Rayner, Miller, & Rotello, 2008). Additionally, when participants looked at a certain part of the advertisement (either picture or text) their attention remained at that aspect until they switched to another element of the advertisement (Rayner et al., 2008). So, taking this research into account, participants in the current study were likely paying attention to the picture first and then switched to the description when they were done. Participants may already base their evaluation on the visual stimulus before reading the description, because an image triggers the same expected reward response in the orbitofrontal cortex (Braun, Amirshahi, Denzler, & Redies, 2013). Since participants seem to focus on the picture first or sometimes even solely, the text might have less influence or no influence on the expected reward. Additionally, research has found that visual information led to a higher purchase intention than written information (Mitchell & Olson, 2000). So, the picture could also have affected the purchase intention instead of the language manipulation. Future research should find a way to highlight the description more. For example, by putting the description in the picture, or decreasing the size of the picture so it does not overshadow the text.

Even though there were no effects of language framing, there was a significant effect of food type on expected reward. A higher desire for unhealthy food might not be surprising because previous research found that unhealthy food is associated with a higher reward compared to healthy food (Davis et al., 2006; Papies, 2013). The amount participants were
willing to spend being higher for healthy food was a surprising result because it was predicted that the amount participants indicated would reflect the expected liking and food reward (Brunstrom & Rogers, 2009). The average amount should thus have been higher for unhealthy food since it triggers a higher expected reward according to earlier studies. A possible explanation for this result could be that people have the perception that healthy food is generally more expensive than unhealthy food (Haws, Reczek, & Sample, 2017). This healthy = expensive intuition would have made participants answer a higher amount for healthy food, even though the expected reward and desire might have been lower.

A significant correlation between desire and purchase intention was expected based on the previous research. A high expected reward is related to a high desire (Papies et al., in press), and desire should be correlated to purchase intention (Papies, 2013). There was no correlation effect between purchase intention and the amount participants were willing to spend on a meal, but this can be explained by the previously mentioned healthy = expensive intuition (Haws et al., 2017). A high price does not necessarily reflect a high reward, since healthy food was considered more expensive, but the desire was higher for unhealthy food.

In addition to purchase intention and expected reward, various control variables were measured. Results indicated that the healthy food advertisements were more credible and persuasive than unhealthy food advertisements. Moreover, advertisements with healthy descriptions for unhealthy food were less credible and less persuasive than unhealthy food advertisements with a neutral or indulgent description. This can be attributed to a low congruence between the description and the food. Earlier research found that a high credibility score increases purchase intention of the product (Bouhlel, Mzoughi, Ghachem, & Negra, 2010). Furthermore, high credibility advertisements are also more persuasive (Pornpitakpan, 2004). The difference in credibility scores may thus affect the design and therefore results: highly credible advertisements may already evoke a higher purchase intention regardless of the language manipulation.

Furthermore, the background variables hunger level and whether a participant had eaten a meal in the past seven days were measured. The latter could have impacted the results since earlier studies found that participants’ desire to eat a food decreased when they had eaten that food before (Havermans, Janssen, Giesen, Roefs, & Jansen, 2009). The participants who had one of the meals before could have evaluated expected reward (desire) lower because they felt satiated, and not because the language affected the expected reward. The results, however, showed that whether or not a participant had eaten a meal before in the past seven days did not affect the results. Additionally, results showed that the purchase intention
of unhealthy food was higher when hungry. In line with previous research this result shows that a higher hunger level could determine food choice, since the consumer would be more likely to choose a food that has a high expected satiety when hungry (Bilman, van Kleef, & van Trijp, 2015).

Some limitations were encountered when conducting the study and analysing the results. Firstly, personal food preference and dietary restrictions were not measured. One participant indicated in the box where they could state the amount they were willing to spend on a meal that they did not like salmon, hence the low scores. Personal preference and dietary restrictions could have affected the results since the language manipulation does not have a chance to affect those participants in those cases. The participant would have simply seen a dish they did not like or could not eat and would have given a low score, even though language manipulation on a description of a food they like could have had an effect on purchase intention and/or expected reward. Future research could take this into account by implementing a question to measure personal preference and/or dietary restrictions in the questionnaire.

Although the materials had a high ecological validity by viewing them online, the ecological validity of this study was low. People usually do not see advertisements in questionnaires, so future research should take that into account by providing a more real-life setting. Future research could, for example, use eye tracking to see which descriptions attract the most attention or which descriptions are looked at the longest to determine desire and purchase intention. This allows participants to look at the advertisements in a more natural manner. It might make the experience more immersive for participants which increases participants’ engagement and that, in turn, may enhance the quality of the data (Bangcuyo et al., 2015). Additionally, future research could let participants rank the meals from most to least favourite to test desire. Based on the answers, it was suspected that some participants did not answer the questionnaire attentively and filled in the same score for all meals. Ranking may force participants to actively think about their answer, thus improving the validity.

Overall, this study did not show an effect of language on the purchase intention or expected reward of healthy food. Even though the results were not as expected, this study still has implications. Firstly, the results could indicate that Instagram is not the right social media platform to use a specific type of language to try and encourage healthy eating because the picture might impact the results. A more text-based platform such as Twitter might give different results since the text will play a more prominent role. Secondly, it is good for
advertisers to know that this study does not provide evidence that language affects purchase intention and expected reward on Instagram. More research is needed to see whether consumers are not more or less likely to buy food based on the language that is used. For unhealthy food, however, healthily framed descriptions may decrease the credibility and persuasiveness of the advertisement since the description and food are not congruent with each other. Finally, the results contribute to the overall theory on how to make healthy food more attractive by possibly ruling out the effects of language framing on Instagram advertisements.
Reference List


Appendix

Appendix A: Statement of Own Work

CIW English

Statement of Own Work

Student name: Yuan Druijff
Course code and name: Bachelor thesis, LET-CIWB351-IBC-2019-SCRSEM2-V
Lecturer: Laura Speed
Number course group: Group 2

PLAGIARISM is the presentation by a student of an assignment or piece of work which has in fact been copied in whole or in part from another student’s work, or from any other source (e.g. published books or periodicals or material from Internet sites), without due acknowledgement in the text.

DECLARATION:

I certify that this assignment/report is my own work, based on my personal study and/or research and that I have acknowledged all material and sources used in its preparation, whether they be books, articles, reports, lecture notes, and any other kind of document, electronic or personal communication

Date: 08-06-2020
Appendix B: Instagram Advertisements (Materials)

Unhealthy food

Pizza

Hamburger
Nachos

Healthy food

Salad
Vegetable curry

Salmon
Appendix C: Full SPSS analyses background variables

There were no significant main effects of food type ($F(1, 189) < 1, \eta_p^2 < .001$) and framing ($F(2, 378) < 1, \eta_p^2 = .003$) on the desire (ER1) whilst controlling for hunger level. There were also no significant interaction effects between food type and hunger level ($F(1, 189) = 3.58, p = .060, \eta_p^2 = .019$), framing and hunger level ($F(2, 378) < 1, \eta_p^2 = .003$), food type and framing ($F(2, 378) = 1.38, p = .253, \eta_p^2 = .007$), and between food type, framing, and hunger level ($F(2, 378) = 1.30, p = .275, \eta_p^2 = .007$).

Additionally, there were no significant main effects of food type ($F(1, 183) < 1, \eta_p^2 < .001$) and framing ($F(2, 366) < 1, \eta_p^2 = .001$) on the amount a participant was willing to spend (ER2) whilst controlling for hunger level. No significant interaction effects were found between food type and hunger level ($F(1, 183) < 1, \eta_p^2 = .003$), framing and hunger level ($F(2, 366) < 1, \eta_p^2 = .004$), food type and framing ($F(2, 366) < 1, \eta_p^2 = .001$), and between food type, framing, and hunger level ($F(2, 366) < 1, \eta_p^2 = .004$).

No main effects of food type ($F(1, 189) = 3.78, p = .053, \eta_p^2 = .020$) and framing ($F(2, 378) < 1, \eta_p^2 = .004$) on purchase intention were found whilst controlling for whether participants had eaten a shown meal before in the past seven days. There were no interaction effects between food type and whether a participant had eaten a meal before ($F(1, 189) = 2.09, p = .150, \eta_p^2 = .011$), framing and whether a participant had eaten a meal before ($F(2, 378) < 1, \eta_p^2 = .004$), food type and framing ($F(2, 378) < 1, \eta_p^2 = .004$), and between food type, framing, and whether a participant had eaten a meal before ($F(2, 378) = 1.15, p = .317, \eta_p^2 = .006$).

There were no significant main effects of food type ($F(1, 183) < 1, \eta_p^2 < .001$) and framing ($F(2, 366) < 1, \eta_p^2 = .001$) on the amount a participant was willing to spend on a meal whilst controlling for whether a participant had eaten one of the shown meals in the past seven days. No significant interaction effects were found between food type and whether a participant had eaten a meal before ($F(1, 183) < 1, \eta_p^2 = .003$), framing and whether a participant had eaten a meal before ($F(2, 366) < 1, \eta_p^2 = .004$), food type and framing ($F(2, 366) < 1, \eta_p^2 = .002$), and between food type, framing, and whether a participant had eaten a meal before ($F(2, 366) < 1, \eta_p^2 = .004$).
There were no significant interaction effects between food type and whether participants had eaten a shown meal before in the past seven days ($F(1, 189) = 2.51, p = .115, \eta_{p}^2 = .013$), framing and whether participants had eaten a shown meal before ($F(2, 378) < 1, \eta_{p}^2 = .001$), food type and framing ($F(2, 378) < 1, \eta_{p}^2 = .001$), and food type, framing, and whether a participant had eaten a shown meal before ($F(2, 378) < 1, \eta_{p}^2 = .004$).