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*Researching Types of Language on Likelihood to Order Healthy or
Unhealthy Restaurant Meals: Menus including Indulgent, Health-
focused and Neutral Language*

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Abstract

In this study, an experiment of different types of language was conducted on Dutch natives' intentions to order a meal from a restaurant menu. The different types of language in this study were indulgent language, health-related and neutral language. The experiment measured the effect of using different types of language on a menu description on order intention. The menu included both healthy and unhealthy meals. The aim of the study was to see whether using a certain type of language can lead to a higher order intention of healthy meals. Unhealthy meals are seen as more filling and satisfying compared to healthy meals. Hence, the unhealthy meals could already have a higher level of order intention. However, the possibility of using language to increase that level was tested here.

The study focuses on Dutch participants and therefore the descriptions of the meals were written in the Dutch language. The words used in the descriptions had been rated through sensory norms. Since the study had a within-subjects design, all the meals were described in all types of language but were presented in either indulgent, healthy or neutral language.

Findings show that type of language does have a significant main effect on order intention. It was found that health-related language leads to the lowest level of order intention for both healthy and unhealthy meals. There was no significant effect of type of food (healthy or unhealthy) on order intention.

Introduction

Healthy vs. Unhealthy Foods: Obesity

Eating habits of this world's inhabitants has changed drastically over the last decades. A study done by Gorski and Roberto (2015) explained how the diets of inhabitants of mostly all the countries in the world have changed due to fast food and consuming larger portions. Therefore, the world's population has been consuming more calories which is a primary cause of obesity (Bleich et al., 2008). Moreover, the researchers have also come to knowledge that not only eating more unhealthy meal options has increased, eating healthier meal options has been reduced. These can all be causes for a growing prevalence of obesity worldwide.

Previous studies have shown that having a regular and healthy diet early in life, are key factors to maintaining this healthy diet to prevent obesity (Ha et al., 2022). The same accounts for when having a mostly unhealthy diet from a young age and forward, according to Ha et al. (2022). Having eaten unhealthily as a child, is difficult to change as an adult and thus unhealthy meals are still part of one's diet as an adult. Therefore, it could be difficult for people to encourage a healthy eating lifestyle.

Nonetheless, obesity can have many negative consequences for a human. The quality of live is severely reduced due to bodily pain and can lead to decreased abilities of physical activities (Hruby et al., 2016). With so many people tending to become obese and the causes being present worldwide, some researchers even name obesity a worldwide epidemic (Caterston et al., 2004). In the current society, eating unhealthily is promoted whereas eating healthily is simply only advised. Moreover, eating unhealthily has become much easier without most people knowing it. The modern product offers, for example in supermarkets, are mostly processed foods with a high number of added ingredients such as sugar, fat, and salts (Gorski & Roberto, 2015). Hence, the products are mostly manipulated and not as nutritious as non-processed foods and contain more calories. Processed foods therefore make it difficult for the body to regulate its weight and it is not a correct food intake. Since processed foods are cheaper to produce, maintain a longer 'shelf life' and have a high retail value, they are attractive and very profitable to produce (Stuckler et al., 2012). Thus, the production and consumption of these processed foods is highly unlikely to be put an end to. However, promoting healthy meals can help create a balance between healthy and unhealthy eating patterns. For example, by using different types of language, healthy foods could also be made attractive.

Healthy vs. Unhealthy Foods: Prejudices & Presentation

Gorski and Roberto (2015) have identified many different factors and causes to why people tend to prefer an unhealthy meal over a healthy meal. There can even be psychological evidence. Previous research has shown that certain foods can cause a similar reaction into the brain as addictive substances like drugs and alcohol can produce (Gorski & Roberto, 2015). Hence, the decision on whether to eat healthily or unhealthily can be influenced by the idea that eating an unhealthy meal brings more pleasure and is therefore more likely to occur. According to Gorski and Roberto (2015), other evidence says that people mostly make their decisions on what to eat whilst doing groceries. People tend to purchase food based on their physical appearance and attractiveness (Zellner et al., 2010). According to the Zellner et al. (2010) study, unhealthy products in supermarket tend to look attractive which can lead to humans choosing that unhealthy product as their meal.

The fact that people have been eating healthier recently, can maybe also be blamed on prejudices people have on healthy foods. For example, studies show that people see healthy foods as less filling and less satisfying (Suher et al., 2016). In reality, the judgement is considered subjective since the reasoning is based on health perceptions instead of nutritional factors (Suher et al., 2016). The judgements are not made based on the number of calories that a certain meal contains, merely on the idea whether the meal is healthy or not. A study by Brunstrom et al. (2008) found that people judge 200 calories of pasta as filling as 900 calories of cashew nuts.

Suher et al. (2016) concluded two determinants that support the idea of healthy foods being considered less filling. When people think of healthy food, soup and salads come to mind. These meals are in literal numbers light in weight and density. Whereas when thinking about unhealthy meals, people think of pizza and fries that are truly somewhat heavier in weight and density. Thus, being considered more filling. Therefore, there exists a bias that unhealthy meals are considered to be both more satisfying and more filling. However, there have been conducted studies which investigated whether language could alter this bias.

Research has investigated the descriptions that restaurants use on their menus to describe the meals they offer. Interesting is how healthy meal options tend to have a less appealing description than unhealthy meals on the menu. Turnwald et al. (2017) conducted a study on the idea that healthy food descriptions are unappealing in American restaurants. They investigated $N = 26$ submenus with $N = 5.873$ words derived from health-labeled items. They compared the health-labeled words to words derived from standard menu items with $N = 38.343$ across 22 qualitative themes such as taste and texture (Turnwald et al., 2017). The researchers were able

to see how restaurants described healthy meals on their menus with significantly less appealing themes and significantly more health-related themes. The descriptions of the healthy meals contained fewer exciting and appealing words compared to the descriptions of the unhealthy meals. Unhealthy meals contained a lot of indulgent language in their descriptions whereas the healthy meal options contained mostly nutritious words. Also, the healthy meals only enclosed 7.7% of menu item space with only 2 images compared to almost 23 images for unhealthy meal options (Turnwald et al., 2017). This could be another example of how unhealthy meals are seen as more attractive and are therefore easier to describe using attractive language.

Not only did Turnwald et al. (2017) find that the descriptions of a menu item could make a meal more appealing, they have shown more evidence for the fact that people prefer taste and indulgence over healthy and therefore prefer unhealthy meals over healthy meals. In general, this could mean that the likeliness that people order the healthy meal can be considered lower compared to the unhealthy meal that was proposed more appealing. Perhaps when the indulgent and more appealing language is used in descriptions of healthy meals in the same way how it is used in descriptions of unhealthy meals, the level of appeal of that healthy meal could possibly increase.

Previous literature has shown that by using language, one could increase eating simulations. Eating simulations could be described as a strategy to modify desire for food or choice (Muñoz-Vilches et al., 2020). A study done by Turnwald and Crum (2019), is a good example of this phenomenon. The researchers conducted 4 different studies regarding language and food. The study focused on the impact of food labeling on people's decision-making regarding food and their enjoyment. The first experiment the researchers conducted, was in a school cafeteria setting. Researchers asked the cafeteria employees to promote a certain dish firstly described using health-related words, such as 'good for you,' 'healthy,' etc. The meals were also promoted verbally. A day later, the cafeteria employees were asked to promote the same meal using taste-focused words, such as 'delicious' and 'best you have ever eaten.' Results show that the participants were more likely to buy the meal when it was promoted using taste-related words instead of health-related words. A similar experiment had been conducted on businesspeople during conference lunch time. However, instead of expressing the different types of language verbally, written language on labels was now used. Results show that also in adults' meal preferences, taste-related words led to higher numbers of consumption compared to the health-related words.

In another experiment done by Turnwald and Crum (2019), the researchers focused on the effects of different types of words regarding the level of enjoyment when eating the food. For

this experiment, participants received the same foods but with different labels. It was either labeled using health-related or taste-related words. Results show that the levels of enjoyment when consuming the foods were higher when the food was labeled using taste-related language. This study concludes that in order for people to enjoy healthy foods, labeling the food using taste-related words has a positive effect on one's level of enjoyment.

Since Turnwald and Crum (2019) had conducted their experiments on different target groups, both adults and young-adults, and since the results were quite similar, the reliability of the effects of language on food perception and decision making can be considered high.

Also, according to the study conducted by Turnwald & Crum (2019), it is important for healthy foods to be labeled in words regarding taste to gain a positive effect on people's purchase intentions as well as levels of enjoyment. In this study, the importance of adding psychological factors, like taste perception, clearly came forward in order to improve healthier eating habits (Turnwald & Crum, 2019). However, what the study of Turnwald and Crum (2019) did not include in their experiment, was using a neutral (language) factor to evidently state the effects that the healthy- and taste-related language had. Also, it was conducted in a cafeteria context, where language on labels might not be as important as the looks of the products itself. For example, on a restaurant menu, the language could be of greater importance since the meal cannot yet be seen.

The Current Study

A study on the effects of different types of language on likeliness to order a meal in a restaurant setting, will be conducted. Important background information is available from studies such as Turnwald and Crum (2019), who discovered that language has an influence on the levels of enjoyment when thinking about eating certain foods. Moreover, in that study, language played an important role in increasing one's eating simulations. Other important findings can be found in the Papiés (2013) study, who discovered that certain words could activate certain eating simulations. The Papiés (2013) study was performed on Dutch university students and their possible eating simulations. The goal of the study was to have the students describe typical features of certain objects, such as its color and its use. The answers had to be spontaneous. Participants were explained to name 5 features as a minimum, but they had been given room for 15 features. The objects were unhealthy food options, such as chips and vanilla ice cream and neutral meal options such as an apple and rice. Some objects used in household were also part of the study as a distraction factor from the food options. After the initial task where participants had to name object features, they were given a second task where they were

asked whether they would like to eat one of the food items presented in the previous task, mixed with 25 other items. Finally, the participants rated 18 food items of which 8 items critical to the study. Results show how specifically tempting food related words stimulate eating simulations. The tempting food items were described with the use of more tempting (unhealthy) food language than the neutral food options. Additionally, the unhealthy foods were described with words regarding what is it like to eat them (e.g. crispy, hot etc.), compared to neutral food items that were described based on what they look like (e.g. colorful, fresh). The tempting words used in the Papies (2013) study, have the same meaning and function as indulgent language in this study. The study by Papies (2013), showed the significance of indulgent language on eating simulations. However, yet again there had not been included a neutral factor, like neutral language. Moreover, the Papies (2013) study also did not include healthy meal options.

Another important study is the research done by Papies et al. (2020), who investigated language to increase the appeal of plant-based foods, used psychological theories and language, to make a description of a plant-based food sound more attractive. The suggestion was that descriptions using more ingredient related language are experienced as less attractive whereas descriptions that trigger certain simulations, or re-experiences will increase the attractiveness (Papies et al., 2020). By examining descriptions of 'ready meals,' researchers found that descriptions of meat items, had more references to eating simulations than vegetarian foods, and slightly more than plant-based foods (Papies et al., 2020). These descriptions, or labels, were manipulated by researchers to include either eating simulations words (e.g. crispy, fresh etc.) or not. After presenting different descriptions of both plant-based and meal-based foods to participants, the researchers investigated whether the descriptions let the participants to wanting to eat the food or thinking about eating it. Results show that food labels containing simulations-based language increased eating simulations and attractiveness. The researchers also concluded that frequent meat eaters found plant-based foods less attractive (Papies et al., 2020). However, this assumption was altered when the plant-based food was described using eating-simulation words. Therefore, Papies et al. (2020) came to a general conclusion that language can influence people to eat more healthily.

Even though the literature that was previously discussed all measured the effects of language on eating simulations, there are some important factors missing. The language they used, had not been clearly defined on whether it was related to taste, health or etc. A study performed by Speed & Brysbaert (2022) had university students rate a total of $N = 24,036$ Dutch words on their sensory contents. The question was on which sense the word was most related to. For example, some words had a high score on taste, whereas others on smell. The words and

their ratings were collected in an Excel sheet. On the contrary of previous research, this study will use these ratings of certain words to emphasize eating simulations. Therefore, the language that will be used, does in fact relate to taste or health for Dutch readers. This can be seen as a missing factor in previous literature, where they only assumed the language as being related to either taste or health. Previous studies had not used ratings before, where it is in fact of great importance when you want the reader to evoke a certain eating simulation. The ratings of certain words can help the researchers in the current study identify those words as either indulgent, health-focused or neutral with regard to its relation to the senses.

Previous studies done on language and its effects on food purchasing and/or enjoyment, such as the study done by Turnwald & Crum (2019), also included taste-related and health-related language. However, the study did not propose a neutral language factor and therefore it is more difficult to identify the possible increasing desire for healthy food because of either the indulgent words used or the health-related words. Meaning, a higher desire for a certain meal was either led because of the use of indulgent language or the health-related language. When using neutral language, it is clear to see which type of language caused an effect on food desire. Including neutral language in descriptions, as will be done in the current study, will serve as the neutral factor to clearly see the effects that certain types of language can have.

The study that Turnwald et al. (2017) conducted on the descriptions of menus in American diner's, is also similar to this current study. However, Turnwald et al. (2017) did not investigate the effects the language had on persons. This is because Turnwald et al. (2017) did not apply their knowledge – the fact that language differs for healthy and unhealthy meals – to humans. Meaning, their study was not directly applied to human perception. Moreover, they did not investigate whether the language had an effect on the diner's guest likeliness to eat a certain meal compared to another. They solely investigated the language used on restaurant menus. Papies (2013) and Papies et al. (2020) did investigate whether participants want to eat a certain food item – based on the language that was used to describe the food item -, but not in a dining context where people are considering whether to choose a meal as their possible, hypothetical dinner. Even though previous studies have researched the effects of indulgent language, e.g. (Papies, 2013; Turnwald et al., 2017; Turnwald & Crum, 2019; Papies et al., 2020), the current study will measure the effects of different types of language on a Dutch native's restaurant order intention. Besides indulgent language, health-focused and neutral language will be included. Instead of attractiveness and appeal, this study will focus on the likeliness to order and therefore the effects the language has on the participants. The focus is on language on restaurant menus and not on labels or products, which for example has been done in studies like

Zellner et al. (2010) and Papies et al. (2020). Moreover, the inclusion of neutral language makes it unique compared to other studies, such as Turnwald and Crum (2019), where they only investigated health- and taste-focused language. Even though Turnwald et al. (2017) did investigate language on menu cards, they did not apply their materials and/or experiments onto human perception. Meaning, people were not included in the experiment. Including different types of language on restaurant menus has not yet been done before in previous literature. The interest is to measure the effects of types of language on the likeliness to order, preferably, a healthy meal over the unhealthy meal. Examples of indulgent language are words such as ‘crunchy,’ ‘tasteful,’ and ‘creamy,’ that help the meal sound more appealing. Health-focused words are words that relate to the healthy ingredients of the meal and the nutritious factors. Also, general words that are commonly used in a diet- or health-vocabulary. Neutral words are food-related words that explain the origin and form of the meal. Neutral words can also relate to the way the food was prepared, e.g. ‘baked,’ or ‘cooked.’ It is of great importance that the neutral words did not at all relate to either taste or health. Since if it did, it cannot be considered as neutral. In this study, the concentration will be upon Dutch people and on the Dutch language.

The research question that will be handled throughout this study is: *‘What are the effects of different types of language on healthy and unhealthy foods on a Dutch native’s order intention?’* The overall hypotheses are:

H1: Types of language in restaurant menu descriptions will have a significant main effect on order intention.

- H1a: Indulgent language will have a higher order intention than healthy and unhealthy meals.
- H1b: Healthy language will have lower order intention than healthy and unhealthy meals.

H2: The effect of language on order intention, will differ between the types of food.

- H2a: The effect of language on order intention will be bigger for healthy food compared to unhealthy food.

H3: The unhealthy meal options will have a higher order intention than the healthy meal options.

Methodology

Subjects

Participants consisted of native Dutch people only who speak Dutch as their mother tongue. The researchers have recruited the participants through their own network. Besides their own

network, it had been allowed for the participants to forward the study to other possible participants. This was feasible, since the study took place online. The participants did and could vary in age. Participation was voluntarily and had not been rewarded. Even though there exist possible (age) limitations to using social media as a platform to introduce this study, different media had been used to have as much inclusivity as possible. For example, besides Instagram and WhatsApp, LinkedIn had also been used.

A number of 146 participants was the desired number based on the research of Papies et al. (2020). In that study, researchers conducted an online experiment using a 4x2 within-participants design and thus having 8 levels. The study design of 8 levels was divided over 170 participants. Hence, they had 21.25 participants per level. In order to apply this for the current study, we could round up the number 21.25 to 22 and include them in the 6 levels, meaning the study will need 132 participants. However, possible dropouts should be considered, hence increasing the participant count by 10% will make it a total of $N = 146$. This allows for a maximum of 10% of participants to drop out of the current study without endangering the methodology and reliability of the study. Unfortunately, the goal of 146 participants had not been met. Luckily, regarding the 10% dropout, the minimum number of 132 participants had been met.

For this study, data of a final number of 143 participants had been collected. The mean age of participants was $M = 29.14$, $SD = 15.15$. The genders of the participants were not divided evenly. A total number of 103 female participants can be found in the overall number of participants. 37 of the participants were of the male gender and 1 participant preferred not to say their gender.

Out of all of the participants, 35.7% were university students or graduates. The second largest group with a percentage of 24.5% were HBO students or graduates. The smallest group with a percentage of 0.7%, belonged to PhD graduates.

Materials

The study used menus containing different types of language as its material. In this study, the first independent variable was type of language and it had 3 levels: indulgent language, health-focused language, and neutral language. The second independent variable in this study was healthiness of the food which had two levels: unhealthy and healthy. Three different menus had been presented online in Qualtrics containing meals and its descriptions with the different types of language. The menus contained 6 meals that were considered unhealthy and 6 meals that were considered as healthy. Therefore, there have been 12 meals with each 3 separate

descriptions written using 3 different types of language. The descriptions were randomized and divided over 3 different menus. Each participant had experienced all the types of language, but the language had differed across the meals for the participants in 3 different menus. The differences in the menus were the descriptions. For example, in menu 1 the salad had been described using indulgent language, in menu 2 using health-focused language and in the third in neutral language. Participants had received either one of three menus. The meals had not been changed and had been presented in the same order, only with different descriptions.

The language in which the menu cards were written was Dutch. The descriptions of the meals contained approximately 6 to 12 words in total, with an average of 9 words. The indulgent words were similar to words used in previous studies, for example words that came forward in Papies (2013) and Papies et al. (2020). The words were checked in the Speed and Brysbaert (2022) database, since the words needed to have a high rating on taste in order to be indulgent. A rating was considered high for indulgent once it was above 3.0 on taste on a scale of 1 through 5. The health-focused language had also been derived from Papies et al. (2020), Papies (2013) and general words relating to health or diet-vocabulary. The health-related words should not have had a high rating on taste in Speed and Brysbaert (2022) sensory norms, since that would have made the word indulgent. Examples were words as ‘fat-free,’ ‘nutritious’ and ‘light.’ As a control condition, neutral language had also been used in the stimuli. Examples of neutral language were words such as ‘classical,’ ‘traditional’ etc. The neutral words should not have related to any senses or any attributes of food. However, neutral words could give more information on ingredients, such as ‘Italian parmesan cheese.’ In this example, ‘Italian’ is the neutral word. For neutral language also counts that the rating of the word should not have been high on taste in Speed and Brysbaert (2022).

The second independent variable, healthiness of the food, had two levels: either the meal is healthy or unhealthy. The consideration as to when it was healthy or not, had been based on the number of calories the meal contains. Meals up to 677 kcal had been considered healthy, whereas meals that contained more than 677 kcal had been considered unhealthy based on the study by Sun et al. (2020). In this study, researchers found the number of calories that is perceived as unhealthy by consumers. Since in this study consumers were also involved, it would have made sense to focus on consumers’ perception. The calculation of the calories within a meal had been done using a mobile app for regulating diets, called Yazio. The 6 healthy meals that had been included on the menu are a Caesar salad (342 kcal), Indian curry (168 kcal), tomato soup with toast (182 kcal), steak with broccoli and cooked carrots (280 kcal), smoked salmon with grilled vegetables (224 kcal) and grilled turkey tortilla with lettuce, tomato,

cucumber and kidney beans (234 kcal). The 6 unhealthy meals of this study were cheeseburger with French fries (745 kcal), chicken ‘sate’ with peanut sauce and potato bites (749 kcal), pizza margherita (681 kcal), fish and chips (987 kcal), spareribs with potato bites (703 kcal) and cheese and bacon pancakes with powdered sugar and syrup (705 kcal).

Design

The study had a 3x2 within-subjects design. Type of language was the first independent variable in this study with three levels: indulgent, health-focused and neutral. The second independent variable was healthiness of the food which has 2 levels: healthy and unhealthy.

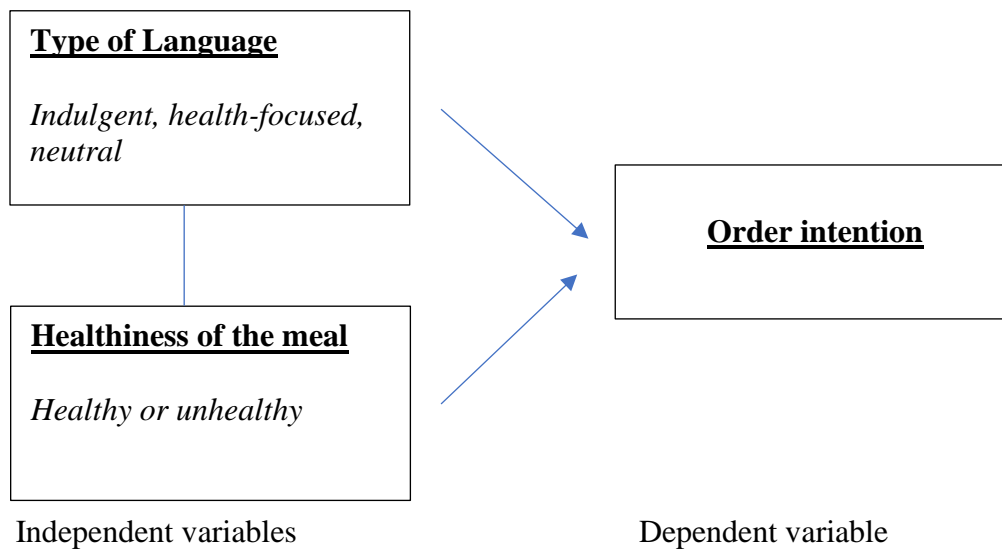


Figure 1: Analytical Model

Procedure

Participants were able to participate in the study online using Qualtrics. In Qualtrics, the three different menus had been made including the descriptions in the different types of language and the healthy and unhealthy meals. After each description, the participants had to answer two Likert-scale questions. The questions were very similar. This had been done to calculate Cronbach’s Alpha to ensure the reliability of the answers. The results of the Cronbach’s Alpha test needed to be interpreted between 0.7 and 1.0 for the study to be named reliable.

Besides the Likert-scale questions on likeliness to order, there has been included one question at the beginning regarding hunger level. This question had served as a control

condition to check whether level of hunger could lead to ordering certain types of food. People consider healthy meals to be less filling, based on a study done by Suher et al. (2016) and therefore the healthy meals could have been chosen less likely when people were hungry. When there were many participants with a high number of hunger level, their answers had been further analyzed in comparison with participants on low hunger levels.

Instruments

The instruments that had been used in this study were the Qualtrics survey's including the study materials. Furthermore, SPSS had been used to calculate and analyze the results.

In the Qualtrics questionnaire, Likert-scales were used. The scales were used to answer 2 questions per meal. The first Likert-scale question was *'How likely are you to order this meal?'* on a scale of 1 through 7. As a reliability factor, the second question was *'Imagine you are in a restaurant, do you see yourself ordering this meal as your dinner?'* At the beginning of the questionnaire, another Likert-scale question was included asking about participants' hunger level. The question had been stated simply, such as: *'How hungry are you at this moment?'* This question had also been asked on a scale level. However, this time it had been on a scale of 1-10 with 1 meaning 'not hungry' and 10 meaning 'very hungry.'

Statistical Treatment

For the statistical treatment, 3 two-way ANOVAs will be used since there are two different independent variables on which for this current study, both its effects on the dependent variable were measured. A two-way ANOVA had been calculated to measure the overall results of the study. For follow-up analyses, another 2 two-way ANOVAs had been calculated for participants with high- and low-hunger levels. Cronbach's Alpha had also been calculated to measure the consistency of the answers.

Results

Reliability – Cronbach's Alpha

To ensure the reliability of the dependent variable, a Cronbach's Alpha reliability test was conducted. The reliability of 'order intention' was reliable: $\alpha = .81$. To rate the reliability of the dependent variable as acceptable, an outcome of the Cronbach's Alpha test of .70 and above is needed. Therefore, since the outcome of the Cronbach's Alpha of the current study is .81, the dependent variable is reliable and acceptable.

Analysis of Variance – Type of Language and Type of Food

To compare the means of the language type and the food type, a two-way analysis of variance was conducted to measure the univariate means of type of language and type of food on order intention. The two-way ANOVA showed a significant main effect of type of language on order intention ($F(2, 284) = 34.62, p < .001$). Type of food was not found to have a significant main effect on order intention ($F(1, 142) = .37, p = .544$). The interaction between type of language and type of food on order intention did not have a significant main effect either ($F(2, 284) = .47, p = .628$). The pairwise comparison of language on order intention showed solely a significant difference of healthy language on order intention compared to indulgent and neutral ($M = 3.63, SE = .096, p < .001$). Healthy language had a significantly lower order intention compared to indulgent language ($M = 4.33, SE = 0.095, p < .001$) as well as compared to neutral language ($M = 4.48, SE = .090, p < .001$). The pairwise comparison test showed no significant differences on order intention for both indulgent and neutral language ($p = .159$).

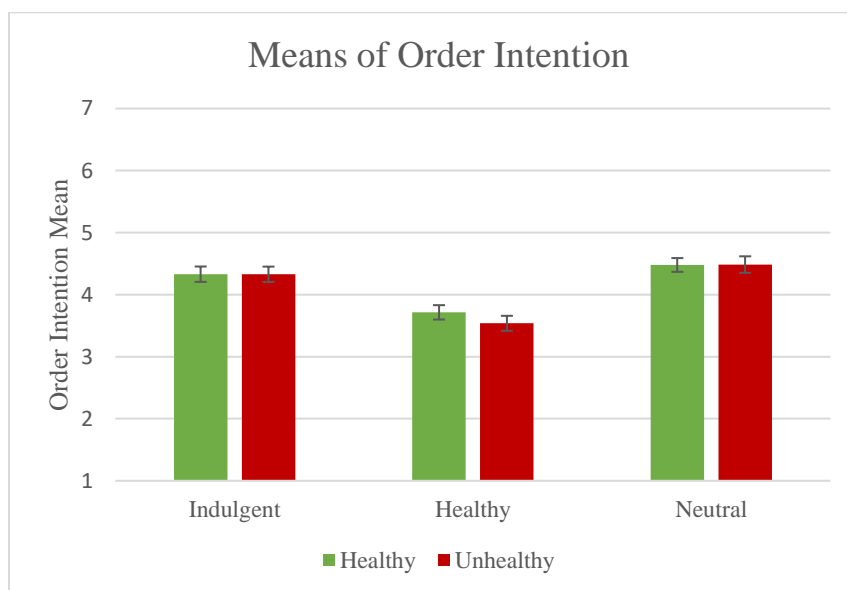


Figure 2: Bar chart on type of food and type of language on the means of order intention with standard deviations.

Analysis of Variance – High Hunger Level

As a follow-up test, a two-way ANOVA has been performed on the results of participants with a high hunger level. A high hunger level is considered high when the hunger-rate number is between 6 and 10 on a scale of 1-10. A total number of 51 participants met these standards (35.66%). 15 participants with the rating of 5 on hunger level, were treated as neutral and not included in the follow-up test (10.49%). These results had been selected and conducted in a

two-way ANOVA test. The two-way ANOVA on participants with a high hunger level showed another significant main effect of type of language on order intention ($F(2, 100) = 22.44, p < .001$). There was no significant main effect on type of food on order intention ($F(1, 50) = .002, p = .961$). Moreover, the interaction between type of language and type of food on order intention had not been found on participants with high hunger level as well ($F(2, 100) = .45, p = .642$). The pairwise comparison of the effect of language on order intention for hungry people, showed a significant effect of healthy language compared to indulgent and neutral ($M = 3.48, SE = .165, p < .001$). Healthy language led to a significantly lower order intention compared to indulgent language ($M = 4.48, SE = .154, p < .001$) and neutral language ($M = 4.59, SE = .140, p < .001$). The pairwise comparison test did not show a significant difference on order intention for indulgent and neutral language ($p = .486$).

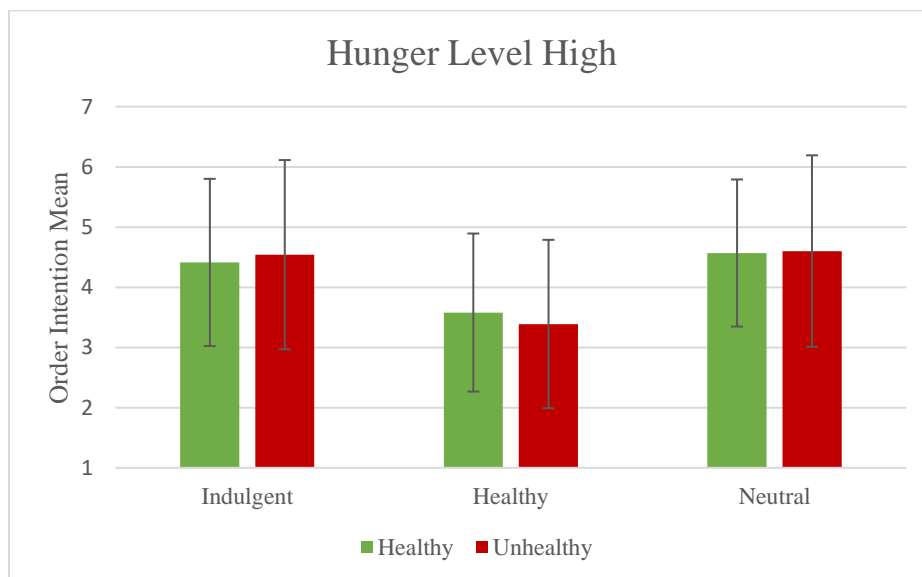


Figure 3: Mean results of order intention for hungry participants with standard deviations.

Analysis of Variance – Low Hunger Level

Another follow-up test had been performed as a two-way ANOVA on results of participants with a low hunger level. The researchers accounted a low hunger level as a rating lower than 5 on a scale of 1-10. These standards had been met for a total of 77 participants (53.85%). 15 participants with the rating of 5 on hunger level, were treated as neutral and not included in the follow-up test (10.49%). The results of participants with a low hunger level had been gathered separately and conducted in a two-way ANOVA test. There has been found a significant main effect on type of language on order intention with participants with a low hunger level ($F(2, 152) = 12.42, p < .001$). However, there has not been found a significant main effect of type of food on order intention ($F(1, 76) = 1.92, p = .170$) and between the

interaction of type of food and type of language on order intention ($F(2, 152) = .21, p = .811$). The pairwise comparison on non-hungry participants showed a significant effect of healthy language compared to indulgent and neutral on order intention ($M = 3.74, SE = .128, p < .001$). Healthy language led to a significantly lower order intention compared to indulgent language ($M = 4.25, SE = .129, p < .001$) and neutral language ($M = 4.44, SE = .127, p < .001$). The pairwise comparison test did not show a significant difference between indulgent and neutral language on order intention ($p = .230$). The effect of language on order intention did not change depending on hunger level.

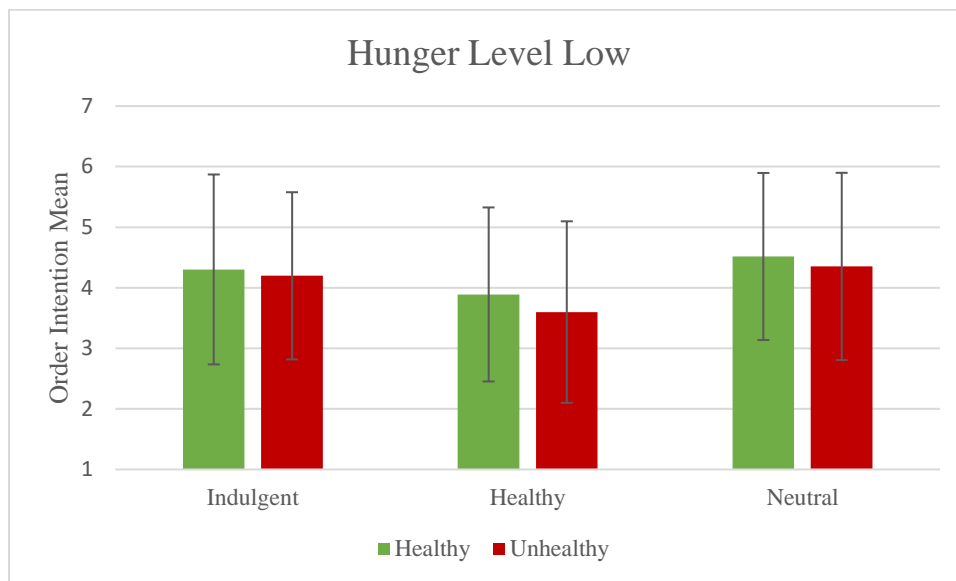


Figure 4: Mean results of order intention for non-hungry participants with standard deviations.

Conclusion & Discussion

General Outcomes

The goal of this study was to investigate whether different types of language on a menu card – indulgent, healthy or neutral – and different types of food – healthy and unhealthy – had an effect on the order intention of Dutch native speakers.

Prior to the experiment, several hypotheses of the outcome of the study had been proposed. When looking at the results, the hypothesis that language will have a significant main effect on order intention can be accepted. However, the hypothesis that language will show an effect on order intention of healthy meals, had not been found. Hence, this hypothesis is rejected. Furthermore, there also was no higher level of order intention on unhealthy food compared to healthy.

There had been found a significant main effect of language on order intention. By using a follow-up test, we found that healthy language led to a significantly lower intention to order.

Therefore, we can conclude that using healthy language on a menu will not increase order intention for a Dutch restaurant guest. Furthermore, since there was no significant difference between indulgent and neutral language on order intention, we cannot conclude that using those types of language will lead to high order intentions.

However, type of food did not show a significant effect on order intention. Therefore, looking at the overall results, researchers can only state that type of language had an effect on order intention, whereas type of food did not have an effect. Moreover, the effect of language did not differ for the order intentions of healthy and unhealthy food.

Outcomes of Hunger Level Tests

Since hunger level also was measured in the experiment, we used this variable as a follow-up test. The results of the hunger level were divided in either high or low. There was no difference between the results of hungry and not hungry participants. Moreover, the results also did not differ from the general results. Yet again only type of language showed a significant main effect on order intention. Moreover, solely health-related language had a significant effect on order intention.

Interestingly, the same encounter with the general results occurred here. Health-related language led for both hungry and non-hungry participants to a lower order intention.

Discussion

This study focused on the effects of using different types of language on order intention for Dutch participants. The results show that healthy language led to lower order intention compared to indulgent and neutral language. When looking at the hypotheses suggested at the initiation of the study, several conclusions can be drawn when discussing the results. Indulgent language was expected to have higher order intention rates compared to the other types of language, as can be seen in studies such as Turnwald and Crum (2019) and Papies (2013). Those results were not present in the current study and thus that hypothesis can be rejected. The effect of language also did not differ for healthy and unhealthy food. Moreover, since there were no significant differences on the order intention rates between healthy and unhealthy meals, that hypothesis is also rejected. In studies such as Suher et al. (2016) and Papies et al. (2020) researchers came to knowledge that unhealthy food is being regarded as more satisfying and filling. This conclusion was not present in the results of the current study. Not even for participants who were experiencing a high hunger level during the questionnaire. Even though the psychological phenomenon on food perception regarding level of nourishment as mentioned

before, explained by Suher et al. (2016) exists and is proven to be true. On the contrary, there also was no evidence that non-hungry participants preferred the healthy meals, since they are considered to be less filling according to Suher et al. (2016).

As mentioned before, in contradiction to previous studies such as Turnwald and Crum (2019), Turnwald et al. (2017), Papies (2013) and Papies et al. (2020), the results of the current study did not show a significant main effect of indulgent language compared to neutral and healthy, on order intention. This finding could be explained due to the fact that those previous studies did not include a neutral factor, the neutral language. The previous literature mainly inspected the effects of health-related and indulgent language on food perception. Papies et al. (2020) did investigate whether adding words related to the experience of eating the food or not adding those words, is similar to being a neutral factor, they did not include neutral language as a whole. In the current study, neutral words were identified and used in the descriptions instead of only leaving out the health-related and indulgent words. This was important for a follow-up analysis to identify which type of language caused for a high or low order intention. Because of this, we were able to find that health-related language is not good for order intention. Therefore, perhaps the significant effect of indulgent language in the previous studies, was present because of healthy language being regarded as unpleasing, and not necessarily because of the indulgent language being regarded as attractive. Furthermore, looking at the results of this study, there were no differences between indulgent and neutral language, thus how big of a role does indulgent language play? Maybe the idea that healthy language is not attractive might outweigh the role of indulgent language and the idea of certain words that activate eating simulations, like shown in Papies (2013).

Nevertheless, there could be identified some limitations to the current study. For now, the study has only been performed on Dutch participants without – for example – comparing them to other language speakers. Perhaps the findings can differ when the different types of language are applied to speakers of another language instead of Dutch. For example, results of preference between healthy and unhealthy meals differed between Dutch and Americans when comparing this study to Gorski and Roberto (2015) and to Ha et al. (2020). This because cultural differences but also language differences play a role. Not only for the preference between the type of meals, but also for the effect of language on order intention. For example, the English language might have more taste-related words than the Dutch language. This was also noticeable during the study. Translating the English indulgent words to Dutch was very difficult, since the Dutch language does not have a Dutch equivalent to certain English (taste) words. Secondly, the mean age of the participants was close to 30 and the participants mostly

consisted of university students. This could lead to differences on food perception, or the influence of language might be greater for younger people than for older people. For example, older people might not concentrate on the language being used in the descriptions, merely on what the meal contains. Furthermore, younger people can be more interested in the descriptions and the language or vocabulary being used to describe a meal.

Besides the participants, the study was designed as an online study. Perhaps when the study was performed in person with real menu cards and in a restaurant setting, the findings could have been different since in that case, the participants would have had to choose a meal that they literally want to eat at that moment. Perhaps then, the different types of language could have had a bigger influence on the participants' orders. Since in this study, solely order intention was measured but not the actual order. When in a restaurant, people are deciding what to eat and therefore maybe decision making should be measured as well. Perhaps in an actual restaurant setting, indulgent language could have been of greater importance on a participants' decision, since they are really going to eat the meal they choose. In that case, indulgent language might be more persuasive.

Taking the limitations into consideration, it could be interesting for future studies to bear these in mind. For example, designing a study with different menu cards containing descriptions with several types of language in an actual restaurant setting. This could create a more important role for the language and a more relevant atmosphere in which the participants really pay attention to the descriptions given on the menu card. Besides this, their decision on what to eat is also more accurate, as they are really going to eat it. Also, broadening the criteria for the participants to take part of the study could be interesting to investigate whether the results are different. Changing the criteria could mean people of another or different ethnicities but also a larger variety in language and background. Since the current study consisted of many university students as participants, the ages and backgrounds of the participants were similar. Different cultures may play a role in food preference as well. Maybe there exists certain cultures who mainly eat vegetarian, or other cultures who mainly eat nutritious or unhealthy meals. Background of the participants should also be taken into consideration. For example, not everyone eats out in a restaurant often and might even be unfamiliar to menus and a restaurant atmosphere. Thus, those people could have different points of interest when looking at a menu card. Moreover, they are not used to meals being described so they might be easier to influence, due to lack of experience. As also mentioned before, language differences from different ethnicities are important to consider. Since one language might have more sense-related

vocabulary, other might have more object-related vocabulary (Frazier, 1970; Vial, 2019). Therefore, making meal descriptions can vary in different languages.

To further investigate the results of the study, taking neutral language into consideration is of great importance. Previous literature showed that the focus was on taste- and health-related language. As mentioned before, it would be important for future research to conduct more experiments using neutral language as a control variable. Since only then, the differences of the effects of the types of language can be identified. In general, a possible suggestion for future research could combine the listed limitations: a real restaurant setting with different menu cards containing health, neutral and indulgent language with a large variety of participants. Moreover, comparing taste words between at least two languages is crucial to learn the differences in taste-related vocabulary.

The investigation of language on order intention did show interesting factors. Restaurant owners can now have more knowledge on how to promote certain meals on their menu cards. Using indulgent language might not be the correct way to do this, even though many people could still think otherwise. Regarding restaurant owners, once reading the findings of this study, they know what type of language not to use on their menus. For society it could be of interest to pay attention to how language is used in labels in supermarkets, but also on advertisements from fast-food chains. Marketeers now know that when promoting a healthy product, the healthy language should not be included. For other researchers it could be of use since by using neutral language and comparing it to the other types of language, researchers can clearly see what type of language causes a certain effect. Besides health- and taste-related language, it should not be forgotten to include.

Studying the effects of different types of language on order intention led to the conclusion that by using health-related language, order intention is negatively influenced.

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Appendix

Menu descriptions – Derived from Qualtrics

Menu 1:

- Q1 (Indulgent): "Krokante Caesar salade met knapperige croutons en lekkere Parmezaanse kaas" – *Crispy caesar salade with crunchy croutons and tasty parmesan cheese*.
- Q2 (Neutral): "Amerikaanse cheeseburger met Roma tomaten, belegen kaas en verse frietjes" – *American cheeseburger with roma tomatoes, cheese and fresh fries*.
- Q3 (Healthy): "Tomatensoep van rijpe tomaten, natuurlijke basilicum en een mandje koolhydraatarm brood" – *Tomatosoup from ripe tomatoes, natural basil and a basket of low-carb bread*.
- Q4 (Neutral): "Hollandse kipsaté getopt met milde pindasaus en boeren aardappelpartjes" – *Dutch chicken 'saté' topped with mild peanut sauce and farmers' potato parts*.
- Q5 (Neutral): "Gerookte zalm met traditioneel gegrilde seizoensgroenten" – *Smoked salmon with traditionnally grilled seasons vegetables*.

Q6 (Healthy): "Ovenverse pizza margherita met vetarme kaas" – *Ovenfresh pizza margherita with fat-free cheese.*

Q7 (Indulgent): "Fish en Chips van krokante kabeljauw met ambachtelijke friet" – *Fish and Chips from crispy cod with artisanal fries.*

Q8 (Healthy): "Licht gegrilde kalkoen tortilla met biologische sla en slanke kidneybonen" – *Lightly grilled turkey tortilla with organic lettuce and slender kidney beans.*

Q9 (Indulgent): "Lekkere pannenkoeken met kaas en spek met verrukkelijke poedersuiker en stroop" – *Tasty pancakes with cheese and bacon with delicious powdered sugar and syrup.*

Q10 (Healthy): "Eiwitrijke biefstuk met voedzame broccoli en vitaminerijke wortels" – *Protein-rich steak with nutritious broccoli and vitamin-rich carrots.*

Q11 (Neutral): "Indiase curry met zoete aardappel en kikkererwten" – *Indian curry with sweet potato and chickpeas.*

Q12 (Indulgent): "Heerlijke spareribs met knapperige aardappelpartjes en een smaakvolle salade" – *Delicious spareribs with crispy potato parts and a tasty salade.*

Menu 2:

Q1 (Healthy): "Gezonde Caesar Salade met lichte croutons en halfvolle Parmezaanse kaas" – *Healthy caesar salade with light croutons and semi-skimmed cheese.*

Q2 (Healthy): "Magere Cheeseburger met biologische tomaten, slanke kaas en zoutarme frietjes" – *Slender cheeseburger with organic tomatoes, slender cheese and salt-free fries.*

Q3 (Neutral): "Tomatensoep van lokale tomaten en basilicum met een mandje geroosterde sneetjes brood" – *‘Tomatosoup from local tomatoes and basil with a basket of toasted bread.’*

Q4 (Indulgent): "Smaakvolle kipsaté getopt met zalige pindasaus en krokante aardappelpartjes"

Q5 (Indulgent): "Gerookte zalm met heerlijke gegrilde groenten" – *‘Tasty chicken saté topped with delicious peanut sauce and crunchy potato parts.’*

Q6 (Neutral): "Klassieke pizza margherita met gesmolten kaas" – *‘Classic pizza margherita with melted cheese.’*

Q7 (Healthy): "Fish en Chips van vetvrije kabeljauw met licht gebakken friet" – *‘Fish and chips from fat-free cod with lightly baked fries.’*

Q8 (Neutral): "Klassiek gegrilde kalkoen tortilla met gekropte sla en Mexicaanse kidneybonen"

Q9 (Neutral): "Traditionele pannenkoeken met gesmolten kaas, varkensspek met poedersuiker en stroop" – *‘Traditional pancakes with melted cheese, bacon, powdered sugar and syrup.’*

Q10 (Healthy): "Eiwitrijke biefstuk met voedzame broccoli en vitaminerijke wortels" – *Protein-rich steak with nutritious broccoli and vitamin-rich carrots.*

Q11 (Indulgent): "Overheerlijke curry met smakelijke zoete aardappel en kikkererwten" – *Delicious curry with tasty sweet potato and chickpeas.*

Q12 (Healthy): "Slanke spareribs met voedzame aardappelpartjes en een gezonde salade" – *Slender spareribs with nutritious potato parts and a healthy salade.*

Menu 3:

Q1 (Neutral): "Traditionele caesar salade met gebakken croutons en Italiaanse Parmezaanse kaas" – *Traditional caesar salade with baked croutons and Italian parmesan cheese.*

Q2 (Indulgent): "Sappige cheeseburger met rijpe tomaten, romige kaas en knapperige frietjes" – *Juicy cheeseburger with ripe tomatoes, creamy cheese and crunchy fries.*

Q3 (Indulgent): "Tomatensoep van romige tomaten en smakelijke basilicum met een mandje knapperig brood" – *Creamy tomatosoup with tasty basil and a basket of crunchy bread.*

Q4 (Healthy): "Eiwitrijke kipsaté getopt met voedzame pindasaus en lichte aardappelpartjes" – *Protein-rich chicken saté with nutritious peanut sauce and light potato parts.*

Q5 (Healthy): "Gerookte zalm met gezonde gegrilde groenten" – *Smoked salmon with healthy grilled vegetables.*

Q6 (Indulgent): "Heerlijke pizza margherita met smeuijge kaas" – *Delicious pizza margherita with creamy cheese.*

Q7 (Neutral): "Fish en Chips gemaakt van Noorse Kabeljauw met oudhollandse friet" – *Fish and chips from Norwegian cod with old-fashioned Dutch fries.*

Q8 (Indulgent): "Ambachtelijk gegrilde kalkoen tortilla met knapperige sla en overheerlijke kidneybonen" – *Artisanely grilled turkey tortilla with crunchy lettuce and delicious chickpeas.*

Q9 (Healthy): "Volkoren pannenkoeken met vetvrije kaas en biologisch spek, poedersuiker en stroop" – *Wholemeal pancakes with fat-free cheese and organical bacon, powdered sugar and syrop.*

Q10 (Neutral): "Kwalitatieve biefstuk met gestoomde broccoli en gekookte wortels" – *Quality steak with steamed broccoli and cooked carrots.*

Q11 (Healthy): "Voedzame curry met vitaminerijke zoete aardappel en kikkererwten" – *Nutricious curry with vitamin-rich sweet potato and chickpeas.*

Q12 (Neutral): "Amerikaanse spareribs met gebakken aardappelpartjes en een frisse salade" – *American spareribs with baked potato parts and a fresh salade.*

The menu descriptions were derived from Qualtrics.

Jansen, F.A.W., Glaubitz, F.K., & Alderen, M.P.G. van (2023). *Type of Language on Order Intention*. Radboud University [Dataset] from https://qfreeaccountssjc1.az1.qualtrics.com/jfe/preview/previewId/1e711ec5-d669-4f9a-8a9b-1d53ec63f9fb/SV_6LJAGrrzaosPVtQ?Q_CHL=preview&Q_SurveyVersionID=current