The Effect of Sensory Language on Meal Perception

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Abstract

Over the recent years and with the rise of Covid-19, people have become increasingly more aware of the impact that diet has on their overall health and the importance of a healthy lifestyle. While a change in diet seems easy in theory, research has found that people are not always willing to give up taste and choose a healthier meal option. However, research has also shown that language can play a role in making people opt for healthier food options by making use of sensory language. Additionally, the rise in globalisation has led to people leading an increasingly more international lifestyle, in which language plays a significant role. This research looked at how different types of sensory language, *Indulgent* and *Traditional*, can effect the meal perception of healthy meals in both the L1 and the L2. The study was conducted through an online questionnaire that was distributed in two different language groups, L1 and L2. The L1 group consisted of Dutch native speakers who saw the descriptions in Dutch, and the L2 group consisted of English native speakers who also read the descriptions in Dutch. The participants were asked about their perception of three different meal descriptions using *Indulgent, Traditional* and *Neutral Language*. The results found that *Indulgent Language* led to an increased meal perception compared to both *Traditional* and *Neutral Language.* No significant effect for language type or interaction effect was found in the analysis. An additional analysis was done to investigate the role of hunger that the participants felt at the time of the questionnaire, and found that this did not play a role.

Keywords: Sensory Language, Indulgent Language, Traditional Language, L1 vs. L2, Healthy Meals, Meal Perception.

Introduction

The rise of the Covid-19 pandemic has led to people becoming increasingly aware of the importance of leading a healthy lifestyle (Kabalt, Tjepkema, van Ooijen & Verheijen, 2021). Obesity and type 2 diabetes were found to be notable risk factors for severe COVID-19, as these are diseases that cause a decrease in the functionality of the respiratory system (Butler & Barrientos, 2020). The current western diet that is often adopted is high in sugars, refined carbohydrates and saturated fats, increasing the risk for these types of illnesses (Althubaiti, 2022). To limit the risk of these types of illnesses and increase the immune system, a change towards a healthy lifestyle and diet is needed.

Healthy vs. Unhealthy Food

Recent research suggests that a change in diet might not be as easy as it might appear. Studies have shown that people have the implicit belief that unhealthy foods taste better than healthy foods and that they are unwilling to sacrifice taste for health (Raghunathan, Naylor & Hoyen, 2006; Carrillo, Varela & Fiszman, 2012). The study by Raghunathan et al. (2006) found that people were able to group unhealthy food much faster when they had to be classified with words describing enjoyment and tastiness as opposed to words lacking enjoyment or taste. This suggests that there is a strong implicit association between unhealthy food and tastiness. In follow-up experiments, people rated foods presented as “unhealthy” as tastier compared to the same foods labelled as “healthy”, showing that the type of description used also has a direct effect on the perception of the food. Carrillo et al. (2021) asked their participants to rate the perceived healthiness and acceptability of biscuits and found that when people were given the nutritional information of all the biscuits the option rated highest in perceived healthiness was given the lowest acceptance rate. This suggests that perceived healthiness does not automatically mean that people choose these certain food options. Unconscious thought patterns or habits are difficult to break as they are automatic and triggered by certain environments (Maio et al., 2007). This means that people are unaware of these patterns and do not know what makes them perform certain behaviours. For changes to be made in these types of behaviour, people first have to be conscious of the behaviour they are displaying and the specific triggers that cause it (Maio et al., 2007).

Sensory Language

In order to help people make healthier diet options, researchers have started to look at how language can play a role in the decision-making process. Various studies have looked at the effect that food descriptions can have on the perception of that particular food and found that sensory-focused language increased the appeal of that particular food (Papies, Johannes, Daneva, Semyte &

Kauhanen, 2020; Speed, Papies & Majid, 2020). Papies et al. (2020) found that after having read food descriptions of ready-meals found in supermarkets, participants reported higher levels of attractiveness and eating simulations (re-experiencing thoughts about taste, texture and pleasure of a particular food item) when they read the simulation-based descriptions. Simulation-based descriptions are a type of sensory language as they contain sensory, hedonic and context words. These types of descriptions trigger eating simulations in the readers, which in turn can lead to an increase in the attractiveness of that particular food. This is explained by the Grounded Cognition Theory of Desire and Motivated Behaviour (Papies, Best, Gelibter & Barsalou, 2017). This theory is based on the idea that choices and experiences of people are based on previous experiences that they have stored in their memory and are retrieved when the memory is activated by relevant cues. In another study, participants were asked to rate food words for sensory associations (Speed et al., 2020). They found unhealthy foods to be associated more strongly with smell, taste and interoception (sensations inside the body) and food words were found to be more attractive when they were strongly associated with these aspects. A different study by Papies (2013) showed that people used sensory language more frequently when listing features of tempting food (e.g. cookies) as opposed to healthier food (e.g. apple), suggesting that there is a connection between this type of language and food that people find tempting.

The association between sensory language and food that tastes good can be used to encourage people to choose a healthier option when having to pick between various food options. This was found in a study by Turnwald and Crum (2019b) where people actually consumed the food in a canteen. They saw an increase in healthy food consumption, such as vegetables and salads, when using taste-focused labels as opposed to health-focused labels (e.g. “Light n’ Healthy Salad” vs. “Indulgent Creations Deluxe Salad”). Additionally, taste-focused labels also increased the taste experience of the consumers. Diners rated green beans with a taste-focused label as significantly more tasteful than green beans with a health-focused label. When looking at a longer period, Turnwald and Crum (2019b) found that taste-focused labelling had a long-term effect on the purchase behaviour regarding healthy foods, as significantly more people opted for the healthy option when it had a taste-focused label as opposed to the health-focused label at the end of the trial period of two months. These outcomes can be explained by the fact that the labels focusing on taste allowed people to imagine what it would be like to taste the product instead of focusing on the health benefits that this particular food has. This is in line with the Grounded Cognition Theory of Desire and Motivated Behaviour mentioned earlier. When applied to previous studies, this theory suggests that simulation words often associated with unhealthy foods can be used to encourage people to choose the healthier food option by using these types of words in food descriptions for

healthier foods. This could lead to new experiences where healthy food is connected to being tasty, thus resulting in a change of behaviour regarding healthy eating.

While previous research has shown that sensory-based language has a positive effect on the attractiveness of a meal, the term sensory language itself is still very broad. In general, sensory language is the language that is related to the five different senses, conveying the sensory perceptions that have been observed (Winter, 2019). In the case of this study, the term sensory language is used to convey different aspects in the descriptions of meals. Sensory language was divided into four different categories: *Indulgent*, *Exciting*, *Traditional* and *Location-based Language* by Turnwald and Crum (2019a). *Indulgent Language* is used to make people aware that a "specific sauce is used or the dish is particularly satisfying" (Turnwald & Crum, 2019a). It highlights the richness of flavours and textures that are in the meal and what is done to specific ingredients to make them more appealing to the eater (such as: *glazed, buttery* and *crunchy*). *Exciting Language* describes a specific technique or ingredient that is used in preparing the meal to create more sensation around the meal (e.g. *ripped, unique* and *crushed*). *Traditional Language* can be defined as words that create a sense of nostalgia and trigger memories connected to the food that the reader personally has. The connection between the description and the memories enable the positive association that a person has with the food based on earlier experiences to be reflected onto the food at the present, leading to a positive evaluation of the food in the present. The words used in this language take the people reading the meal descriptions back to the past through the emotional connections that they may have with the food, highlighting the fact that these meals have been made for decades, are what people grew up eating and are thus rooted in tradition (e.g. *classic, homemade* and *original*). The last type of language is *Location-based Language*. This type of language draws attention to a specific culture or location from which the dish originates.

All these types of languages look at different aspects of a dish that can be described to make them more appealing. While many studies, such as Turnwald and Crum (2019b) and Papies et al. (2020) have looked at the difference between sensory language and health-focused language, there have yet to be studies that look at the (possible) differences between these different sub-categories of sensory language. Each of the different categories focuses on a different aspect of a meal, and can therefore lead to a different simulation of the eating experience. I*ndulgent* and *Exciting Language* focus on the taste and preparation aspect of the meal and thus more likely lead to eating experience simulations, while *Traditional* and *Location-based Language* focus on the feelings that surround the meal. The positive feelings that these words evoke in a person are connected to previous experiences with these foods or foods that had the same type of descriptions. As suggested by the Grounded Cognition Theory of Desire, cues that have previously been found to be rewarding

can increase the desire and perceived attractiveness of food. Following this theory, the use of the different types of sensory language would thus lead to an increase in the perceived attractiveness and desire for the food, with *Indulgent Language* leading to a higher increase of perceived attractiveness compared to *Traditional Language* due to its connection to eating simulations.

First vs. Second Language

Another way in which language can affect perception is whether the language in which the description is given is a native language or a second language. Earlier research has found that the language in which a certain food or dish is described, has an influence on the perception of this meal. Khan and Lee (2020) found that consumers attributed characteristics connected to a specific language to a product when the description of this product was in that particular language. In the study conducted in a supermarket in Lahore, Urdu speakers attributed the characteristics of elegance, trustworthiness and prestige to the products when they were in English packaging as opposed to packaging in the vernacular. This showed that even simply changing the language used to describe a certain product could influence how people perceive certain products.

Languages are inherently connected to culture, and thus also to the cultural associations that people might have. How a certain culture is perceived can be translated onto a product via the language used to describe the product (Khan & Lee, 2020). The amount of knowledge that a person has of a language is also an important factor for this study. With a second language, the knowledge of the deeper meaning of words or certain connotations is lesser than that of a first language. Zareva (2012) looked at the difference in the level of word knowledge between first language (L1) and second language (L2) speakers and found that there was a sharp distinction between native speakers and non-native speakers with regards to knowing the meaning of words. The participants were asked how familiar they were with a number of words, after which the familiarity was verified by asking the participants to give synonyms, a brief explanation and word associations of the particular word. These tests showed that even advanced learners were found to struggle with knowing the exact meaning of words they claimed to be familiar with, showing that the word knowledge in a second language is always lower than that of a first language. The notion of ‘deceptive transparency’ in a second language occurs when someone thinks that they are familiar with a specific word, but what they think the word means is completely different from the actual meaning of that particular word Laufer (1997). This shows that there is a distinct difference between the language knowledge of a native speaker and a non-native speaker of a language that may play an important role in the understanding of the language.

Another important aspect regarding language knowledge is the emotional connection that people have with their L1 as opposed to an L2. Multiple studies have found that people have a stronger connection with emotional words in their L1 compared to L2 (Anooshin & Hertel, 1994; Dewaele, 2010). When asked to recall emotional words in both their native language as well as in their second language, participants were able to recall emotional words in their L1 more frequently than in their L2 compared to neutral words (Anooshin & Hertel, 1994). The participants of this study were all fluent in both languages. The results show that there is a strong connection between emotional words and L1. This is also supported by the findings of Dewaele (2010) who looked at the occurrence of code switching (switching between L1, L2, etc.) according to self-reporting. In this study, Dewaele found that people would code switch to an L2 more frequently when discussing emotional topics compared to neutral topics to distance themselves further from the sensitive topics. Code switching to an L2 allowed people to discuss more sensitive or emotional topics without making the speaker feel too vulnerable, thus distancing themselves from the emotion connected to the topic. The difference in language knowledge can play an important part in which choices a person makes when they read descriptions in a language that is not their mother tongue. The associations, connotations and emotional connections that people have with words in their first language are vastly different from those with words in a second language. This would suggest that it is likely that there is a difference to what extent different descriptions in L2 have an effect on the perceptions of meals compared to the same descriptions in their L1.

A foreign language (FL), this can be an L2, L3, etc., is often learnt at a later stage in life and in a controlled setting. The result of this is that the lexical knowledge is gained in a neutral setting, without the emotional connection that these words can evoke (Costa, Foucart, Arnon, Aparici & Apesteguia, 2014). Being in a foreign language context affects the choices that people make, as the decision-making found to elicit emotional reactions based in language play a lesser role (Cici, Gatti, Russo & Vecchi, 2021; Costa et al., 2014). When decisions have to be made in an FL, emotions play a much lesser role in the outcome of the decisions, and the decision-making process is based on the basic meaning of the words. This would suggest that the description used to describe meals would have a stronger effect in the L1 than in an FL, as they are often based on evoking some kind of emotion or feeling in a person.

Present Study

Many previous studies have looked at the difference between health-focused language and sensory-focused language, but the differences between the various types of sensory-focused language have not been studied yet. This knowledge would be beneficial in promoting healthier eating, as it would

show what type of sensory-focused language is the most effective. As found in previous research, sensory-focused language has an effect on the perception of healthy food options (Papies et al., 2020; Speed et al., 2020; Papies, 2013; Turnwald & Crum, 2019b). When looking at the types of sensory language, a distinction can be seen between *Indulgent* and *Exciting Language* and *Traditional* and *Location-based Language*. This study will look at the difference between *Indulgent Language* and *Traditional Language* as these two categories focus on two different aspects of sensory language. *Indulgent Language* focuses more on the characteristics of the food itself, while *Traditional Language* tries to create a positive sense of nostalgia within a person. Both description types try to evoke positive feelings in people that will lead to a positive increase in the perception of the food. Additionally, this study will also look at the effect of first language vs. second language combined with the two types of sensory language. The difference in language knowledge between an L1 and an L2 is significant (Zareva, 2012) with people having a stronger connection to their L1 as opposed to L2 (Dewaele, 2010; Cici et al., 2021; Costa et al., 2014). Additionally, the language in which the description of a product is given also plays an important role in how that product is perceived (Khan & Lee, 2020). This study will compare food descriptions in the first language and second language to see the effect that these different description types can have on the perception of a meal. The research question for this study will be:

What is the difference between indulgent language and traditional language descriptions of healthy meals compared to neutral language on the perception of a healthy meal in L1 and L2?

Previous research has found that simulation-based language descriptions and descriptions strongly associated with gustation and olfaction make food options appear more attractive than options without these types of descriptions (Papies et al., 2020; Speed et al., 2020). *Indulgent Language* is a form of simulation language that highlights the different textures and flavours that are used to complete the meal, which would lead to people re-experiencing particular aspects of specific meals. *Traditional Language* focuses more on evoking positive feelings and emotions in people through memories. According to the Grounded Cognition Theory of Desire (Papies et al., 2017), people make choices based on earlier experiences stored in their memory, which are retrieved when activated by relevant cues. *Traditional Language* acts as cues, leading to the activation of positive memories. However, *Indulgent Language* is directly linked to the eating itself, suggesting that this type of language will have a stronger effect on the perception of a meal compared to *Traditional Language*. *Neutral Language* does not influence the perception of a meal, and thus has a lesser effect than both *Indulgent* and *Traditional Language.* Based on these points, the first hypothesis is:

H1: *Indulgent Language-based descriptions will lead to an increased meal perception compared to Traditional Language-based descriptions, which both will lead to an increased meal perception compared to Neutral Language-based descriptions.*

There is a significant difference in language knowledge between an L1 and an L2 (Zareva, 2012). People have a deeper understanding of word meanings, and higher emotional resonance in their first language (Zareva, 2012; Costa et al., 2014; Anooshin & Hertel, 1994; Dewaele, 2010). Based on the foreign language effect, it is expected that language descriptions in an L1 will lead to an increased meal perception compared to language descriptions in the L2

H2: *Meal descriptions in an L1 will lead to an increased meal perception compared to meal descriptions in an L2.*

Following the first two hypotheses, it is suspected that *Indulgent Language*-based descriptions, as well as descriptions in the L1, will lead to increased meal perceptions compared to the other description types and L2. This is because *Indulgent Language* is directly linked to eating itself and the senses, and people have stronger emotional connections to words in their L1 compared to their L2 (Papies et al., 2020; Speed et al., 2020; Anooshin & Hertel, 1994; Dewaele, 2010). Because of this, a strong interaction between *Indulgent Language*-based descriptions and L1 is predicted.

H3: *The differences in meal perception between Indulgent, Traditional and Neutral Language will be the largest in the L1 compared to the L2.*

Method

Materials

The independent variables for this study were description type and language type. Description type was operationalized in three levels: *Indulgent Language, Traditional Language* and *Neutral Language*. Language type consisted of two levels: L1 (native Dutch participants) and L2 (native English participants). Each of the descriptions consisted of two adjectives and the meal itself, which were the same for the L1 and the L2 groups. The words were selected based on the definitions set for *Indulgent* and *Traditional Language*. The adjectives for *Neutral Language* selected described the most basic characteristics of the meal itself without possibly influencing how the meal might have been perceived. A neutral description was added to the study to ensure that all the descriptions were relatively the same length. As *Indulgent Language* was defined as highlighting the richness in flavours and textures, as well as cooking techniques used to make them more appealing to the eater, the words for this category were selected using sensory ratings from Speed and Brysbaert (2021). Words rating high (4-5 out of 5) on taste and smell were used, such as 'krokant' (crunchy) and 'romig' (creamy). For *Traditional Language*, words were selected based on the definition that was established for this study: words that evoke positive emotions in people due to a connection to positive memories and a sense of nostalgia. Words such as 'huisgemaakt' (homemade) and Oma's (Grandma's) take people back to when they were given home cooked meals by their parents or meals made by their grandmas, leading to positive memories, which in turn are projected on the food that they are presented with. Each participant saw three meal descriptions of three different meals in Dutch, and each meal came in an *Indulgent, Traditional* and *Neutral* version. To minimise the bias based on a specific meal, the combination of a meal and description type were randomised for the participants. The different meal descriptions can be found in Appendix 1. The meals used in this study were a curry, a pasta and a burrito bowl (based on the meals used in Papies, 2020). These meals were chosen as they are not typically associated with either the Dutch or the English culture.

Subjects

The selection criteria for the subjects in this study were that they had to be at least 18 years of age and either have Dutch as an L1 or English as L1 and Dutch as an L2. According to a power analysis with G*Power, a sample size of 142 was calculated to be needed for this study. A total of 277 responses were recorded and after deleting those who did not give consent or met the selection criteria, 269 responses were left. An additional 42 English native responses were deleted due to scoring above an average of six on the Flaitz scale for Dutch, resulting in 227 responses being left for analysis. This was done as the language skills of these people were too close to native to have

Dutch still considered an L2. Of the respondents left, 98 had Dutch as their L1 (43.2%) and 129 had English as their L1 (56.8%).

Of the L1 respondents, 18 were male (18.4%), 79 were female (80.6%) and one respondent identified as other (1%). The respondents were between the ages of 19 and 79 (M = 36.59, SD = 16.24, Ra = 60). The last characteristic analysed was level of education. Most of the respondents had a university education (N = 60, 61.2%), followed by an HBO education (N = 23, 23.5%), MBO diploma (N = 11, 11.2%) and four people indicated that they had a different type of educational level (N = 4, 4.1%). The L2 group consisted of 31 males (24%), 96 females (74.4%), one person who identified as other (.8%) and one person who chose not to disclose their gender (.8%). The respondents in this group where between the ages of 22 and 78 (M = 44.26, SD = 12.5, range = 22-78). Similarly as in the L1 group, most of the respondents in the L2 group followed a university education (N = 94, 72.9%). The second largest group followed a secondary school education (N = 18, 14%), followed by university of applied sciences (N = 9, 7%). Eight people indicated their educational level as other (N = 8, 6.2%). The L2 group was also asked about their proficiency in Dutch, of which the mean was just above average: 3.76 (SD = 1.17, range = 1-5.75).

An independent samples t-test showed a significant difference between the L1 and L2 groups with regards to age (t (176.84) = 3.88, $p < .001$). The L2 group (M = 44.26, SD = 12.50) was on average older than the L1 group (M = 36.59, SD = 16.24). A Chi-square test showed no significant relation between language type and gender ($\chi^2(3) = 1.90$, $p = .593$).

Design

For this study, a mixed research design was used. Description type was a within-subject variable, and language type was a between-subject variable. Each participant saw 3 descriptions assigned in random order in either their L1 or L2, depending on which group they belonged to.

Instruments

The dependent variable for this study was the meal perception based on the description. This was measured via three questions that the participants saw after having seen each of the description types. The questions used were: *How attractive do you find the description of this meal? How likely is it that you would pick this meal to eat? How likely is it that you would choose this meal again if it were an option based on the description?* The questions were the same for the Dutch and the English participants, but each group saw them in their respective L1s. The answers were measured using a seven-point Likert scale, ranging from 'not attractive'/'not likely' to 'very attractive'/'very likely'. The reliability of meal perception comprising the three elements was found to be acceptable

in both languages. The L1 group had a reliability rating of α = .92, and the L2 group had a reliability rating of α = .94.

The language proficiency was measured using the Flaitz scale (1988). This is a self-reporting scale on different language skills: reading, writing, listening and speaking. These skills were measured using a seven-point Likert scale ranging from 'poor' to 'excellent'. Participants who were assigned the L2 descriptions were asked to rate only their L2 language skills. The reliability of the language scale was acceptable: α = .86. Consequently, the mean of all four items was used to calculate the compound variable 'proficiency', which was used in further analysis

Procedure

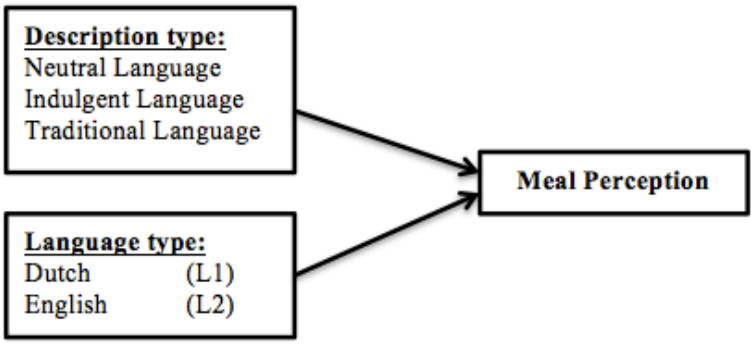
The participants were approached online and were informed that participation was voluntary, anonymous and that they could stop any time they want. The L1 group was approached online and in or via the social circle of the researcher, while the participants of the L2 group were approached via a message in a Facebook group for British expats living in The Netherlands. The participants were given an online questionnaire on Qualtrics (Qualtric, Provo, UT, USA). The participants were first asked to indicate their first language so that they were given the correct version of the questionnaire. They were then asked to rate their hunger level on a 7-point Likert scale before being shown the instructions for the test itself. After the instructions, the participants were given three meal descriptions of which they were asked to rate the scales. After having completed the test, the participants were asked to fill in demographic questions regarding age, gender and education, as well as their form of diet (omnivorous, pescatarian, flexitarian, vegetarian, vegan and other). The questionnaire for the L2 group was concluded with a self-rating language proficiency test based on Flaitz (1988) to determine the language proficiency of their L2. This was done to prevent people from being included in the analysis who were too proficient in the L2 that it would be like a second L1.

Statistical Treatment

A mixed ANOVA was used to analyse the data from the study with description type as a within-subjects factor and Language type as a between-subjects factor. This test was performed using the IBM SPSS programme.

Figure 1

Analytical Model



Results

Mixed ANOVA

A repeated measures analysis for meal perception with description type as a within-subject factor and language type as a between-subject factor showed a significant main effect of description type (F (2,450) = 3.45, p = .032). While the meals with *Indulgent Language* had a significant increased meal perception (M = 4.07, SD = 1.58) compared to the meals using *Traditional* (M = 3.78, SD = 1.47, p = .023) and *Neutral Language* (M = 3.75, SD = 1.48, p = .021). No significant difference was found between *Traditional* and *Neutral Language* (p = .882). There was no significant main effect observed for language type (F (1,225) = 2.77, p = .097) and no significant interaction effect found between description type and language type (F (2,450) = 1.71, p = .182).

Table 1. Means and standard deviations of the meal perceptions per description type and language type combination.

	Indulgent language	Traditional language	Neutral language
L1	4.31 (1.62)	3.78 (1.43)	3.85 (1.56)
L2	3.83 (1.53)	3.78 (1.51)	3.67 (1.42)
Total	4.04 (1.58)	3.78 (1.47)	3.75 (1.48)

Exploratory Analysis

To determine whether the degree of hunger the participants felt at the time of the questionnaire played a role in the effect of description and language type, another mixed ANOVA with the extra variable “hunger” was performed. The participants rating their hunger 1-3 on a seven-point scale were put in the group “not hungry”, and the participants rating their hunger level 4-7 were put in the group “hungry”. The “not hungry” group consisted of 141 participants (62.1%), and the remaining 86 participants (37.9%) were placed in the “hungry” group.

A repeated measures analysis for meal perception with description type as within-subject factor and language type and hunger level as between-subject factors showed no interaction effect between hunger level and description type (F (2, 446) = .06, p = .942) and hunger level and language type (F (1, 223) = 1.81, p = .179). This shows that hunger did not play a role in this study.

Conclusion and Discussion

Conclusion

This study looked at the difference between indulgent language and traditional language descriptions of healthy meals compared to neutral language on the perception of a healthy meal in L1 and L2. *Indulgent Language* was found to have increased food perception compared to *Traditional* and *Neutral Language*, but no increased food perception was found between *Traditional* and *Neutral Language*. Language type or an interaction between description type and language type were also not found to lead to increased meal perception. An additional analysis was done to control for the hunger level that the participants felt at the time of the questionnaire, which was found to have not played a role in the evaluation of the meal descriptions.

Discussion

This study found that *Indulgent Language* based descriptions lead to an increased meal perception compared to *Traditional* and *Neutral Language* based descriptions. This confirms part of the first hypothesis of this study and is in line with the findings of Papies et al. (2022). They found that the use of simulation-based language descriptions can help make food options more appealing to people. *Indulgent Language* based descriptions are a form of simulation language as they highlight textures and the richness of the flavours, which lead to people re-experiencing particular aspects of that specific meal. This finding is also in line with the findings of Speed et al. (2020), who found that words associated with taste, smell and interoceptions are found to be more attractive compared to different words. *Indulgent Language* makes use of these kinds of words and the finding of this study confirms the findings of Speed et al. (2020). No increased meal perception was found between *Traditional* and *Neutral Language*, which was unexpected. Previous research has found that descriptions using sensory language lead to a more positive evaluation of a meal compared to descriptions not using this type of language (Turnwald & Crum, 2019b). However, no research has been done yet that looked at the different effects that the various types of sensory language have. The concept of *Traditional Language* itself is not clear in the literature, making it a more difficult concept to work with, as it does not have a clear definition to work with. A possible explanation for not finding an increased meal perception between *Traditional* and *Neutral Language* could be that the effect of *Traditional Language* in previous studies was affected by the use of other types of sensory language in the same description. It would mean that *Traditional Language* on its own does not have an as strong effect on meal perception as other types of sensory language do. According to the Grounded Cognition Theory of Desire (Papies et al.,2017), people make choices based on earlier experiences stored in their memory, which are retrieved when activated by relevant cues.

Based on this theory, it was expected that the memories that people have connected to the food (words) would be activated when they read the description, which did not happen. A possible explanation could be that the words used in the traditional descriptions did not trigger the right memories or had a strong an effect as other words that could be classified as *Traditional Language* would have. No pre-test was performed to check if the words used for *Traditional Language* would work well within the traditional meal descriptions that were used or if the connection between the words and the meals were logical and natural. Nor was it known whether the words used were associated with tradition or nostalgia, and would thus evoke traditional feelings within the participants. This could possibly mean that the words used did not evoke the right feelings, which in turn would have affected the meal perceptions. The participant group for this study could be divided into two different groups based on their L1, meaning that there are possible linguistic and cultural differences within the group itself. Words that may trigger memories regarding food and tradition in one language may not necessarily do the same in the other language, thus affecting the results of the study.

An increased meal perception was expected in the L1 compared to the L2 group. It was theorised based on earlier findings that people have a stronger emotional connection to their L1 compared to an L2 (Anooshin & Hertel, 1994; Dewaele, 2010), which would suggest that the L1 group would have evaluated the meals higher than the L2 group. However, this was not confirmed by the findings in this study. This could be due to the participants in the L2 group used in this study living in the L2 country. They are surrounded by their L2 language on a daily basis, which would make it likely that they have a stronger connection to the language compared to other L2 speakers who do not live in the L2 country. Additionally, the living situation of the L2 participants makes them also more experienced with reading meal and food descriptions and making food choices that are appealing to them. This could possibly mean that they have a language understanding that goes deeper than is expected of L2 speakers, which would have influenced the outcome of this study. The fact that the two language groups did not come from the same backgrounds also makes it harder to compare the two groups, as there are other factors that can play a role in their evaluations. The original idea for the participant groups in this study was to use people who all had the same L1 (Dutch) and came from the same country to look at the language descriptions in either their L1 or in their L2 (German). However, this set-up was not possible for this present study, but could be useful to look at in the future, as it would make comparisons between the different groups much easier, as it eliminates cultural and linguistic differences between the two groups.

Lastly, it was expected that the difference in meal perception between *Indulgent, Traditional* and *Neutral Language* would be the largest in the L1 compared to the L2. This difference was not observed in the findings of this study, but could possibly be explained by the differences in

participant groups used in the study. As discussed earlier, the two language groups came from different backgrounds, and the participants in the L2 group all live in the country of their L2. This allows for a deeper connection and understanding of their L2 language, as they are surrounded by their second language on a daily basis.

Limitations and Further Research

How a person perceives and evaluates a meal is highly subjective. While this study tried to control for this by incorporating different meal options, it is still likely that this played a role in the evaluations of the perceptions of the different description types. This could influence the results as people might not necessarily base their evaluation on the description types used, but on the meal itself. The results of the study would then not accurately display the effects of the different description types. A control question about the meal itself could have made the subjectivity aspect more transparent. Asking the participants whether they eat the meal displayed in everyday life or if there are aspects/ingredients to the meal which would lead to them not eating it, would give a better indication of their perception of the meal itself. This is something that could be looked further into in future research.

No pre-testing was done with the descriptions and words used in the study. This means that there is no way of knowing whether the words and descriptions used in this study evoked the right feelings in the readers and had the right associations with tradition and nostalgia that was desired for this study. Seeing as the definition of *Traditional Language* is not clear in the literature, pre-testing would be wise to do in future studies. This is to ensure that the words chosen and the descriptions used evoke the right feelings in the readers and that they would be associated with tradition and nostalgia.

Another limitation was that the participants in the L2 group were fully immersed in the country and culture of their second language. This means that they likely have a deeper understanding of the language than is often the case in second language knowledge, as they use their L2 daily, which might have affected the results of the study. To control for this extra knowledge, future studies could look at the difference in language by using an L2 group that does not live in the L2 country. Another way to control for this is to use participants who all have the same L1 and show them the descriptions in either their L1 or L2. This would make comparing the two groups easier seeing as all the participants in the study would have the same L1 and probably come from the same cultural background, eliminating the these differences between the two groups. The fact that the two groups did not differ significantly in their evaluations of the meals shows that the L2 group had a deeper understanding about the language used in meals than was expected. This

is interesting for further studies to look into deeper, to discover the effect that living in an L2 country has on L2 speakers.

The effect of sensory language in a second language has not been as intensely explored as the comparison between sensory language and healthy language. This is an interesting comparison that can be further studied in the future. This study only looked at two types of sensory language, but there are more types that can be analysed to determine if there are significant differences between sensory languages.

Implications

While the results of this study are limited in the findings, the finding that *Indulgent Language* leads to a significantly more positive evaluation of the meal perception compared to *Traditional Language* in the L1 is one that can be useful. This finding can be used by restaurants and other establishments or companies that want to make healthier food options appear more attractive to the public. A shift towards a healthy lifestyle is needed due to the rise in health-related risks in combination with a poor diet that is common in the Western world. While this study did not find a significant language effect regarding sensory language in an L2, the rise in globalisation and current travel availabilities call for researchers to also look at the significant role that language plays in current society and this study shows that further research about the effect of language on meal perception is imperative.

The results of this study also confirm earlier findings that sensory language has an increased effect on meal perception compared to neutral language, primarily *Indulgent Language*. This substantiates earlier findings that simulation-based language leads to an increased meal perception compared to non-simulation-based language, due to the eating simulations that it evokes in people. Additionally, this study also found that there are differences between the effects of different types of sensory language. *Indulgent Language* was found to lead to an increased meal perception compared to *Traditional Language*, showing that different types of sensory language lead to different effects. This might be due to the different theories that underlie the different types of sensory language; eating simulations for *Indulgent Language* and memories and emotions for *Traditional Language*. Another interesting find of this study was that L1 did not lead to an increased meal perception compared to L2, of which the main reason was theorised to be the living situation of the L2 group. This finding suggests that the language knowledge of L1 speakers and L2 speakers living in the L2 country do no differ significantly from each other with regards to meal perception.

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Appendix

Appendix 1

Table 3. Meal descriptions used in study, critical items in bold.

Description type	Meal description
Indulgent language	**Kruidige** burrito met gemengde bonen en **geurige** rijst
	Pittige curry met rode pepertjes en **krokante** pappadums
	Romige tomatenpasta met Parmezaansekaas en **verse** kruiden
Traditional language	**Huisgemaakte** burrito met **kenmerkende** gemengde bonen en rijst
	Oma's curry met rode pepertjes en **zelfgebakken** pappadums
	Tijdloze tomatenpasta met Parmezaansekaas en **ouderwetse** kruiden
Neutral language	**Goed gevulde** burrito met gemengde bonen en rijst
	Gele curry met rode pepertjes en **dunne** pappadums
	Rode tomatenpasta met Parmezaansekaas en **eenvoudige** kruiden