The shape of salt:
The influence of a package shape and a brand name on the perception of saltiness of chips

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Abstract:

Aim: This study investigates the effect of the shape of a package and the phonetics of the brand name on the perceived saltiness of the product. Currently, our daily dietary salt intake is considerably higher than the advised intake by the World Health Organization. Since a disproportionate intake of salt results in negative health effects like a decreased kidney functioning or cardiovascular issues, it is of great importance to decrease our daily intake. Since the current offer of research on the influence of package cues on perceived saltiness is limited, this research introduces guidelines how a package could be manipulated to higher the perception of salt.

Method: A 2x2 between-subjects experimental design (N = 179), where a rounded versus an angular package and a brand name consisting of rounded phonetics and angular phonetics have been measured to investigate the effect of 'package shape' (rounded versus angular) and 'phonetics of the brand name' (Krusty versus Nabbis) on 'basic tastes', 'expected saltiness', 'freshness' , 'taste intensity', 'product attitude' and 'shape association'.

Findings: Results demonstrated that the shape of the package influences the perceptions of saltiness, wherein an angular package is perceived as saltier than a rounded version. Additionally, a marginal effect was found on the freshness of the product. Here, the angular package was perceived as fresher than the rounded package. Lastly, an interaction effect was found on the shape association, where it is presented that the rounded brand name "Nabbis" appeared to support the correct shape association, wherein the angular brand name "Krusty" seemed to create a lesser effect.

Conclusion: Based on the results, it can be concluded that an angular package is more associated with saltiness than a rounded package. However, no significant effect of the phonetics of the brand name has been found. Nevertheless, to lower the daily salt intake, it is advised to distribute more chips packages in an angular form and lower the amount of salt in the chips.

Keywords: Angular, Rounded, Package, Brand, Phonetics, Chips, Saltiness, Taste, Congruency

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1. Introduction

In recent years, a general trend that has been seen in the world of food consumption is the moderation of food intakes. A reduction of carbohydrates and an increase in vegan food is turning into a general thought and the application stores on mobile phones increasingly offer applications that consist of more precise statistics on the daily intakes of the user. The main motive of consumers to use these applications is to strive for a healthier lifestyle (Sama, Eapen, Weinfurt, Shah & Schulman, 2014). The World Health Organization (2018) reported that globally, 41 million people die caused by noncommunicable chronic diseases. The leading factors of these deaths in 2010 were high blood pressure, smoking and an excessed intake of alcohol.

One of the segments of food that is recently been put in a negative spotlight is the large degree of the salt represented in products. Previous research shows that an excessive intake of salt results in negative health outcomes (Malta, Petersen, Johnson, Trieu, Rae, Jefferson, Santos, Wong, Raj, Webster, Campbell & Arcand, 2018). Here, they presented that a disproportionate intake of salt may negatively influence the blood pressure and the functioning of the kidney and result in a greater risk of cardiovascular diseases like hypertension or even heart failure. In support, an analysis by Prospective Studies Collaboration (2002) on 61 prior conducted experiments demonstrated that the relation between blood pressure and the cardiovascular risk is much stronger than previously estimated.

Therefore, the World Health Organization (2020) recommended a daily dietary salt intake of fewer than five grams per day. However, this intake level of sodium has not yet been achieved by the majority of European countries. According to the European Commission's science and knowledge service (2020), the daily salt consumption of adults in the European Union ranges from 7 to 13 gram per day, where the daily take is the highest in the Czech Republic, namely 13.8 grams, and the lowest in Germany, namely 6.3 grams. These worrisome statistics have resulted that half of the European Union members legislated change through taxations and mandatory nutrition labels on the packages. Even though this resulted in a slight decrease in intake, factors such as consumer acceptance and costs from the use of a healthier alternative are still prevalent.

Since consumers find difficulties with replacing their preferred products with a healthier option, it is necessary to discover how to change the original product to a healthier option without losing the interest of the consumer. In the study of Clement, Kristensen & Gronhaug (2013), it is discovered that consumers have fragmented visual focus during grocery shopping, their visual attention is concurrently influenced and disordered by the shelf display of the product. Besides, the searching progress is dominated by the physical design features, like the shape and the contrast of the product.

Velasco, Woods, Petit, Cheok & Spence (2016) presented that it is possible to convey information about the product through the shape of the package. Velasco, Woods, Deroy & Spence (2014) continue on this train of thought by connecting shape to the taste perception of an individual,

which are sweet, sour, umami, bitter and salty, to a shape. This presented the idea that angular shapes are often referred to the more savoury tastes, whilst rounded shapes are mainly associated with sweeter tastes.

Another package cue that influences the perceived taste of the individual is presented in the phonetics of a brand name. For instance, Gallace, Boschin & Spence (2010) presented that words with rounded phonetics, like "ba" or "mu" are associated with sweetness, whilst words with angular phonetics like "ta" or "ku" were associated with bitterness and saltiness. Besides, these sharper phonetics were also perceived as more intense than the rounded variants.

The final factor that could influence the perception of the consumer is the congruence between the visual cues on the product. According to the Cue Consistency Theory (Maheswaran & Chaiken, 1991), a discongruency between the cues on a package leads to a disconnection with the product, whilst a congruency leads to the enhanced liking of the consumer. The study of Velasco, Salgado-Montejo, Marmolejo-Ramos and Spence (2013), showed that a combination of an angular font and an angular package results in a product that is perceived as sour, whilst a combination of a rounded font and a rounded package is perceived as sweet. However, combining a rounded font with an angular package results in a weaker effect, wherein the product is perceived as less sweet. Thus, creating congruence between the visual cues on a product could enhance a certain perception of the consumer.

Thus, to discover the influence of shape and phonetics, the following research question has been conducted.

To what extent do the shape of the package and the phonetics of the brand name influence the perceived saltiness of the product?

Although there is already a vast amount of research conducted on both the influence of the shape of a package on the perception of the product and the influence of the brand name on this topic, these experiments focused more on the other taste elements, like the degree of sweetness, or on the perceived intensiveness of the product. Specific research on the perception of saltiness is little, and the available content is mainly focused on the influence of the texture of the package (Groothedde & Van Rompay, 2018). Besides, there is currently no research available on the combination of the two variables with regards to the perceived saltiness of the product. Therefore, this research is able to fill a gap in the consisting literature and offers the possibility to discover new theories.

For this research, it has been decided to gather data based on the packages of chips. The main reason for the decision of this object of analysis is due to the general amount of salt that is included in this product. As an example, the Lay's "Naturel" chips consist of 1.1 gram of salt intake per 100 grams, meaning this is already 22% of the recommended daily intake of salt. Secondly, this product attracts a broad audience and is easily relatable. Therefore, the chips have been chosen.

Firstly, a literature review is conducted to create a better understanding of the available research on the influence of the shape of the package and the phonetics of the brand name on the perception of taste. Based on this information, three hypotheses are defined. Secondly, the research methodology is presented through a 2x2 design. Thirdly, the results of this research are presented, analysed and discussed in this part. Finally, the limitations and the practical implications for future research are discussed.

2. Theoretical framework

2.1 Shape of the product

Over the past years, a large number of researchers explored the influence of the shape of a package on the perception of the taste of the product. In a literature review on the correspondence between the taste and shape of the product, this topic, Velasco, Woods, Petit, Cheok & Spence (2016) drew four conclusions.

Firstly, people match the features of taste and shape in predictable circumstances. Secondly, both the package and the shape can convey information about the taste of the product. Thirdly, these characteristics may influence the taste and the perception of the flavour. Finally, the prototypicality of the packaging shape along with the shape-related features should be taken into account when describing the function of the shape of a package. Thus, based on these conclusions it can be stated that the package shape influences the perception of the taste of a product.

A comparison that is often found in literature is the influence of a square or rectangular package versus a rounded package. In general, these studies measured the taste perception of the products with the shape. In the research of Velasco, Woods, Deroy & Spence (2014), four pairs of angular and rounded shapes were used to measure the perceived taste perceptions. The studies demonstrated that people match taste to shapes. For instance, a rounded shape is generally perceived as 'sweet', whilst 'bitter', 'sour' and 'salty' are associated with an angular shape. To support, Velasco, Salgado-Montejo, Marmojelo-Ramos & Spence (2013) discovered that rounded shapes, typefaces and names in a product results in an increase of perceived sweetness, whilst an angular shape, typeface and name results in an increased amount of sourness of the product.

This association does not limit itself to just the gustation of the person. Hanson-Vaux, Crisinel & Spence (2012) showed that there is a correspondence between the odour of a product and the association of a shape. Participants associated the odour of lemon and pepper, seen as bitter and sour products, with a rectangular form while the odour of raspberry and vanilla, seen as sweet, were associated with a rounded shape.

The shape of a package does not only influence the perception of gustation, but it can also affect its perceived intensity it. Becker, Van Rompay, Schifferstein & Galetzka (2010) compared a rounded yoghurt container with a square version. The results showed that the angular product shapes may motivate intense taste sensations.

Thus, based on the prior research, it is assumed that the shape of a package could influence the taste perception of the person. Therefore, this assumption leads to the following hypothesis:

H1: A package with a rounded shape is perceived as less salty than a package with an angular shape.

2.2 Phonetic sound

In an experiment conducted by Köhler (1929), participants were asked to connect the words "Maluma" and "Takete" to two different shapes, one spiked and one round. The participants associated "Takete" with the spiked shape, while the rounded shape was identified as "Maluma". In the course of time, this experiment has been studied multiple times in combination with different words, showing a consistent outcome, for instance by Newman (1933) and Ramachandran & Hubberd (2001). The last-mentioned experiment suggested that the human brain attaches meanings to the combination of shapes and sounds in a consistent matter, presenting that the sharp changes and corners in the lines of the shape resemble the phonetic articulation of the sound "takete", thus leading to an association of sharpness. Furthermore, the human brain associates the phonetic delivery of "Maluma" with rounded lines and corners.

In addition, experiments have been conducted to discover if the native language could be a factor of influence on the association of the participants. The research of Ramachandran & Hubberd (2001) was conducted in native Indian, whilst the research of Köhler (1929) was in Spanish, the research of Newman (1933) in English and the research of Belli (2001) in Italian. Since these experiments wholly represented a consistent outcome, it can be stated that the mother-tongue of the participant does not influence the association.

The age of the individual does not influence the association of the forms. According to the research of Maurer, Pathman & Mondloch (2006), it is presented that both 2.5-year old children and adults matched words with rounded articulations are associated with rounder shapes, whilst the pointed shapes were associated with unrounded articulations. With this result, it can be stated that these cross-modal associations are not influenced by age.

This line of reasoning is also applicable in the association of the taste of food with certain words. In Gallace, Boschin & Spence (2010), it is demonstrated that there is a cross-modal association between the flavour and certain words. For instance, the experiment presented that salt and vinegar flavoured chips were rated more "Takete" than brie and cheddar cheese. Another relevant outcome is that the salty flavours have been associated with "Takete", whilst the counterpart of it, namely sweet flavours, has been mostly associated with "Maluma". As a result, it appears that a link between the taste of food and the sound of words exist. Besides, our brain is capable to extract properties from their taste stimuli and associate them with certain words.

In Ngo, Misra & Spence (2011), this conclusion is supported. Through an experiment with various types of chocolate, it is apparent that the sweeter variants were associated with the rounded sound "Maluma" and "Lula", whilst the more bitter and intensive chocolate was associated with sharper sounds like "Tuki" and "Takete". Similarly, in Spence & Gallace (2010), it is evident that still water is associated with rounded words, while the carbonated variant is associated with primarily angular words. In the research of Liang, Roy, Cheng & Zhang (2013), it is similarly presented that

curved shapes may influence the sweet taste sensitivity, whereas the angular shapes do not affect this sensitivity.

Besides the phonetic structure of the word, the sound pitch of the word is also affecting the perception of the taste. In the research of the sound symbolism of healthy food by Motoki, Park, Pathak & Spence (2020), a robust effect of names containing higher frequency sounds (f, s, i, e) were perceived as being healthier than those names containing lower frequency sounds (b, d, g, o, u), thus presenting that higher sounds in brand names are perceived healthier than lower sounds. In the analysis on the perception of saltiness, it is shown that participants perceived the lower sounds as unhealthy. In Crisinel & Spence (2009), an association between lower-pitched sounds and taste of bitterness, and additionally an association between higher-pitched sounds and sour-tasting food is presented through an experiment with associated words of products. In support, Simner, Cuskley & Kirby (2010) discovered that a cross-model association between taste and sound exists. Furthermore, in line with Crisinel & Spence (200), they discovered that a sour taste pairs with high frequency sounds, while the bitter taste is paired with a low-frequency sound. However, in their experiment bitterness is perceived with mid-tier frequency sounds, whereas sweetness is perceived as the actual low-frequency sound. This is also in line with Motoki et al. (2020).

Thus, based on the prior research, it is assumed that the phonetics of a brand name could influence the perception of taste. Therefore, this assumption leads to the following hypothesis:.

H2: A brand name based of rounded phonetics is perceived as less salty than a brand name based of angular phonetics.

2.3 Congruency

In the study of Maheswaran and Chaiken (1991), the Cue Consistency Theory is presented. This theory entails the relation between both the implicit and explicit cues, presenting two possible ways an individual processes the presented cues. Firstly, when the cues are conflicting with each other, an attenuation effect will occur, resulting in that the cues do not have the desired effect on the customers, ultimately leading to a disconnected effect on the customers. However, when both cues are corresponding the same information, an additive effect appears. This means that the observation of the coherent cues by the consumer results in a positive product evaluation and therefore, a positive effect on the customer occurs.

In the study of Amsteus & Lindgren (2015), the influence of a congruent context between the content of the packaging and the product placement on the attitude of the consumer towards the product was examined. The outcomes showed that although the influence of creating a congruent package was not evident, a negative influence was apparent with an incongruent context. Therefore, they stated that congruence between the different cues is of great importance. This was also presented in the study by Bottomley & Doyle (2006), who stated that the adaption of colours that are

connotatively congruent with the products are considered more appropriate, but that dissonance between these factors create an adverse effect.

Furthermore, as proposed by Reber, Schwarz & Winkielman (2004), the aesthetic pleasure of a product is a function of the processing dynamics of the perceiver, with the suggestion that perceivers receive a more positive aesthetic response when the product is processed fluently. In this research, fluency is determined by the speed and the accuracy of processing the visual cues. A disruption in the conversion of the product could lead to disfluency, which ultimately leads to a negative influence on the perception of the product. Thus, creating congruency in the visual cues while maintaining the fluency increases the perceived likeliness of the consumer.

This train of thought supported by Spence (2016), who indicates that a combination of multiple sensory cues on a package could result in a stronger effect on the consumer. Possible sensory cues that were suggested by Spence (2016) were the colour, the shape, the texture, the weight and the usability of the package. Besides, the auditory and the olfactory cues were discussed, however, these factors were seen as a smaller influence, since the available literature on this topic is limited. The sensory cues mentioned by Spence are in line with Schifferstein, Fenko, Desmet, Labbe & Martin (2013), who showed that the visual cues are the most important modality when a consumer is comparing products to buy, followed by taste.

Ultimately, creating congruency between the cues on a package could lead to a more positive product experience. For example, Fenko, Lotterman and Galetzka (2016) demonstrated that cookies with an angular shape and angular phonetic brand name and cookies with a rounded brand name and a rounded shape were preferred by the consumers.

However, it is of great importance to ensure that the sensory cues on the package are evident. Becker, Van Rompay, Schifferstein & Galetzka (2011) concluded that, when experimenting with the shape and colour of a yoghurt package, the effect of packaging colour on the taste impression was minimal. The presented cause of this result is that the visual cues to test the colour intensity might not have been noticeable enough, since other research proved that the intensity of colour does influence the perception of healthiness of the product (Tijssen, Zandstra, De Graaf & Jager, 2017). Therefore, it is important to create clear visual cues to be able to measure the influence it.

Thus, based on the prior research, it is assumed that a combination of congruent cues could result in a more positive product evaluation. Therefore, this assumption leads to the following hypothesis:

H3a: A combination of congruent cues (angular shape in combination with an angular name and a rounded shape in combination with a rounded name) results in a more positive product evaluation than an incongruent combination (angular shape in combination with a rounded name and a rounded shape with an angular name).

Besides the influence on the product evaluation, visual cues on a package are also able to influence the perceived taste and intensity of the product. For instance, Fenko (2018) states that through multiple sensory packaging cues, it is possible to encourage a healthier choice. Specifically, through the use of colour intensity, packaging shape and packaging material it is possible to nudge the consumer to a healthier product. Van Rompay and Groothedde (2019) suggest that a combination between a taste description, through a claim or slogan on the package, and a surface pattern could provide benefits. Here, they showed that they may have enhanced the taste intensity and sweetness perception through a combination of a surface pattern and a congruent claim on the package.

In recent years, the effect of a package shape and the phonetics of a brand name have been scarcely examined. In the study of Van Rompay and Pruyn (2011), the congruency between the shape of the product and the influence of the font style has been investigated. Here, they presented that congruence between the shape of the product and the typeface positively affects the perceived brand credibility and perceived product value.

In addition, the study of Velasco, Salgado-Montejo, Marmolejo-Ramos and Spence (2013), presented that a combination of an angular font and an angular package results in a product that is perceived as sour, whilst a combination of a rounded font and a rounded package is perceived as sweet. However, combining a rounded font with an angular package results in a weaker effect, wherein the product is perceived as less sweet. Thus, creating congruence between these cues on the product could provide a stronger result.

However, as been stressed by Spence (2011), creating congruence between the shape of the product and the symbolism on the package seems to be particularly effective for mass-marketed food and beverage product where it is straightforward to predict the flavour of the product before consumption. Thus, participants should already have a prior association with the product to be able to give a correct flavour indication.

Based on the prior research, it is assumed that a combination of the shape of the package and a brand name could influence the perception of taste. Therefore, this assumption leads to the following hypotheses:

H3b : A combination of an angular package and a brand name based of angular phonetics is perceived as saltier than a separation of an angular package and angular phonetics.

3 Methods

3.1 Pre-study:

To investigate the influence of the shape of the package and the phonetics of the brand name on the perceived saltiness of the product, stimulus materials, in this case, the brand name and the package design, need to be designed. Therefore, a small-scale preliminary study was conducted to examine the general preference of the participants on the presented brand names and to receive feedback on the first version of the design. Based on the results, the visual prompts that were implemented in the general study were designed.

3.1.1 Participants

For this preliminary study, participants were selected based on the personal network. In total, 16 individuals participated in the questionnaire, where all of the participants were male. Besides, fourteen participants were Dutch, the other two participants were German. Furthermore, they were aged between 19 and 23. All of the participants were assured of the confidentiality and privacy of their data, as well as the fact that participation in the questionnaire was not obligatory and they were free to withdraw from the study at any given time.

3.1.2 Procedure

Due to the current Covid-19 situation and the simplicity of the analysis of the data, it was decided to conduct an online questionnaire, this questionnaire has been created with the online tool "Qualtrics". Firstly, the purpose of the research as well as the manipulations that would be tested in the questionnaire were clarified to the participants. Furthermore, participants have been informed that a visual prompt will be created based on their preferences. After their given consent, participants were presented five different words, which were based on the prior presented literature and sorted in sharper and softer phonetics. For the sharper phonetics, the words "TukTuk", "Krusty", "Tucky", "Terra" and "Crunky" were presented. As for the softer phonetics, the words "Beam", "Mahuma", "Bamble", and "Nabbis" were presented to the participants. The participants were asked to order the given words based on the expected saltiness, blandness, healthiness and unhealthiness. In addition, the participants were asked to rank the words on the favourite name for a chips brand. Thereafter, the participants were asked if there were prior associations with the presented words to ensure that during the main experiment, there is no preceding association that could influence their decisions. Afterwards, participants were asked if there were general improvements for the words.

Consequently, the first versions of the two packages were presented to the participants. Based on these versions, the participants were asked to rate the packages on the appeal, the realism of the product and the association with a rounded and an angular form on a 5-steps scale. Lastly, participants were asked to provide general feedback on the mock-ups.

3.1.3 Results

The responses of the participants were exported and analysed using descriptive statistics with the use of the data-analysis tool SPSS. Based on the selected favourability chosen by the participants, the following results were found. Participants indicated that "Tucky" (M = 2.00, SD = .89) and Nabbis (M = 1.50, SD = .83) were mainly associated with saltiness. The participants associated "Terra" (M = 2.00, SD = 1.28) and "Beam" (M = 2.75, SD = 1.39) with blandness. The words "Terra" (M = 1.37, SD = 0.98) and "Mahuma" (M = 1.89, SD = 1.25) were associated as healthiness, whereas "Nabbis" (M = 2.44, SD = 1.41) and "Crunky" (M = 1.88, SD = 0.96) were perceived as unhealthy words. On the question of which word is most fitting as a brand name for chips, participants indicated that "Krusty" (M = 2.17, SD = 0.96) and "Nabbis" (M = 1.67, SD = 1.05) were the preferred options. Participants presented that there were mainly prior associations with the words "Terra", which was associated with the earth, and "TukTuk", which was associated with the means of transport in the form of a motor-powered rickshaw, mainly present in Thailand.

The first presented package to the participants, which resembled a square package, was perceived as considerably realistic (M = 3.13, SD = 1.17), whereas the products were received as moderately appealing (M = 3.00, SD = 1.41). The package was perceived as rounded (M = 3.00, SD = 1.63), and less as square (M = 2.69, SD = 1.79). The second presented package, which resembled a round package, was perceived as adequately realistic (M = 2.63, SD = 1.36), however, the package was less appealing according to the participants (M = 2.31, SD = 1.36). The package was highly perceived as rounded (M = 4.56, SD = 0.61) and subsequently not perceived as angular (M = 0.55, SD = 0.50). Finally, participants provided feedback on the presented packages. The main consent here was that specifically the rounded version of the chips package was not realistic enough and was perceived as bland.

Based on the results of the preliminary test, the words "Krusty" and "Nabbis" have been chosen as the brand names. For "Krusty", this decision has been made since the word was perceived as the best fitting brand name by the participants. In addition, "Krusty" was perceived as the second most salty and unhealthy word. Since "Nabbis" was perceived as both the saltiest and least healthy word and was observed as the most suitable brand name for a chips brand, it was evident that this was the best option for the research. Additionally, the packages have been adjusted with the provided comments by the participants. The rounded model includes visual cues that are also visible on the general rounded chips packaging, including a plastic, transparent cap on the top of the package and a metallic disc on the bottom.

3.2 Stimulus materials:

This study tests the effect of the shape of a package and the phonetics of the brand name on the perceived saltiness of the product. To be able to measure this, four different packages were created. The chosen product of analysis in this experiment is chips. The main argument for this decision is that chips generally consists of a great amount of salt. Additionally, chips is generally a familiar product for people and therefore lowers the barrier to relate to the product and create an assumption, thus supports the goal to obtain as most profitable data as possible.

To be able to measure the effects of the variables, four different packages of chips have been created. Firstly, to measure the influence of the shape of the package, a square and a rounded package have been created. The two models have been selected and imported from Adobe Stock. Afterwards, the models have been designed with the use of Adobe Indesign and Adobe Illustrator. Secondly, to measure the influence of the brand name, two logos have been created. For the design of the logos, the online tool Canva has been used. Below, the four different package designs are presented.

Figure 2: Rounded package with
an angular brand name

Figure 3: Rounded package with
a rounded brand name

Figure 4: Angular package with
an angular brand name

Figure 5: Angular package with
a rounded brand name

3.3 Main study:

3.3.1 Research design and procedure:

To be able to answer the research question and provide answers to the hypotheses, the influence of the shape of a package and the phonetics of the brand name have been investigated with a 2x2 between-subjects experimental design, where a rounded versus an angular package and a brand name consisting of rounded phonetics and angular phonetics have been measured.

Table 1

Representation of the experimental conditions (N = 179)

Experimental condition	Package shape	Brand-phonetics structure
1	Rounded	Angular
2	Rounded	Rounded
3	Angular	Angular
4	Angular	Rounded

As presented in Table 1, the participants randomly receive an experimental condition. To discover what influence the package has on the perception of saltiness, an online questionnaire has been designed and conducted through the online tool "Qualtrics".

The data collection took place between the fourth of May 2020 until the tenth of May 2020. The questionnaire was distributed with the use of an anonymous link, provided by Qualtrics. As chips are generally a popular product that is easily relatable for everyone and is not restricted to a specific group of age, nationality or gender, the questionnaire was available for everyone above the age of 18. The participants for the questionnaire were approached with the use of social media. On the online platforms Facebook, Linked-in and Instagram, a public post on the timelines was created, in which the followers were asked to fill in the questionnaire. Through Whatsapp, people within the personal network were approached individually with the request to fill in the questionnaire. In addition, with the aim to create a snowball sample, all participants were asked to share the questionnaire with family and friends.

At the start of the questionnaire, a small introduction of the experiment is provided to the participants, as well as an explanation of the procedure of the storage and the handling of the data. It is presented that participation in the questionnaire is voluntary and that the participant has the right to quit the study at any given moment. Respondents were given the option to either consent to the research or restrain from it. After the participant's agreement, one of the four experimental conditions were randomly presented, alongside a small introductory text about the product and the request to examine the design carefully. Afterwards, multiple statements about the product were presented to the participant, based on the constructs 'basic tastes', 'product attitude', 'freshness', 'taste intensity', 'expected saltiness', 'personal preference for savoury food' and 'shape association'. These constructs

consisted between three and four questions per construct. The participants were asked to, judging by the presented design, present to what extent they agreed with the statement on a 5-steps scale, ranging from "Not At All" to "Completely Agree". After answering the statements, the participants were asked to provide their gender, age, nationality, highest finished level of education and closing, their preference for either savoury or sweet food.

3.3.2 Participants:

In total, 208 participants started the questionnaire. However, 29 participants did not complete the questionnaire, resulting in 179 participants that completed the questionnaire. The majority of the participants were female with a total of 104 (58.1%), 73 (40.8%) participants were male and 2(1.1%) identified themselves as a third gender. Furthermore, the participants were aged between 18 and 67 years old, where the average age was 27 ($SD = 10.99$).

The majority of the participants were from The Netherlands with a number of 135 (75%), whereas 31 (17.3%) participants were from Germany, 9 (5%) from another country within Europe and 4 (2.2%) from another country outside of Europe. Most of the participants, namely 60 (33.5%), indicated that high school was their highest finished level of education, followed by students with a bachelor degree at the university, which were 51 (28.5%). Thereafter, The MBO/HBO followed with 43 (24%) and the master degree at the university with 23 (12.8%).

In table 2: the division of the demographics of the participants divided on the different designs is presented.

Table 2: *Division of demographics per condition.*

Participants Condition	Age N	Age M	Age SD	Gender Male N	Gender Female N	Gender Third N	Highest finished level of education Primary N	Highschool N	MBO/HBO N	Bachelor N	Master N	Consumption A N	B N	C N	D N
Rounded package	115														
Angular brand name	79	26.63	11.47	15	17	0	0	31	24	17	7	38	24	16	1
Rounded brand name	36	27.5	10.73	14	18	0	1	11	5	9	9	22	10	4	0
Angular package	64														
Angular brand name	32	26.38	10.96	25	53	1	0	7	9	14	3	20	8	3	1
Rounded brand name	32	27.16	11.29	19	16	1	0	11	5	11	5	15	13	4	0
Total	179	26.93	10.99	73	104	2	1	60	43	51	24	95	55	27	2

Note: Third = A third gender or non-binary, MBO = secondary vocational education, HBO = higher professional education, A = Frequently (at least once a week), B = From time to time (once a month), C = Rarely (less than once a month), D = Never.

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3.4 Measurements:

The questionnaire in this study used a 5-point Likert scale, ranging from "Not At All" to "Completely Agree". Two exceptions have been made to the description of the steps, these exemptions required an indication of an association with a certain shape to be able to measure the construct 'shape association'. In addition, the demographics of the participants were asked through multiple-choice and open questions. For example, participants were asked to provide their age with digits in an open question and their gender through a multiple-choice. In addition, participants were asked to provide their attitude towards savoury and sweet food, and an indication of their general chips intake, with answers ranging from 'several times per week' to 'never'.

To be able to measure the dependent variables and test the hypotheses, five constructs have been created, namely 'basic tastes', 'expected saltiness', 'freshness', 'taste intensity' and 'product attitude'. These constructs have been based on the literature and previous experiments in this area of interest and function to answer the hypotheses. In addition, 'shape association' has been additionally conducted to discover if the shape and the brand phonetics influence other factors. Furthermore, all of the presented constructs have been validated with the use of a factor analysis, where all of the constructs displayed an eigenvalue over 1.

3.4.1 Basic tastes:

The basic taste perception of the participants was measured with four items. Since these items differ greatly from each other, all of the items have been measured individually. Here, the items "I expect the chips to taste sweet", "I expect the chips to taste sour", "I expect the chips to taste bitter" and "I expect the chips to taste salty" have been measured.

3.4.5 Expected saltiness

In addition, to measure the perceived saltiness of the product and the comparison with similar products, the construct "Expected Saltiness' was conducted. This was measured through the statements 'I expect the chips to be salty', 'the chips are saltier than the regular ones', 'The brand name makes me believe the chips are salty', 'The brand name makes me believe the chips are saltier than my regular ones', "The package shape makes me believe the chips are salty' and 'The package shape makes me believe the chips are saltier than regular ones'. ($\alpha = .74$).

3.4.3 Freshness:

The expected freshness of the chips have been measured with three different items in the form of statements, which were "I expect the chips to be crispy", "I expect the chips to be fresh" and "I expect the chips to be crunchy". ($\alpha = .69$)

3.4.4 Taste intensity

With the use of three items, the taste intensity of the product has been measured. Firstly, the two items "I expect the chips to taste strong" and "I expect the chips to taste intense" were measured. The item "I expect the chips to taste bland" was reversely coded to successfully be in line with the other two. ($\alpha = .78$)

3.4.2 Product attitude:

The product attitude was measured with three items, namely "In general, I would like these chips", "I like the packaging of the chips" and "I would buy the chips in a grocery store". ($\alpha = .82$)

3.4.6 Shape association

Finally, based on the experiment of Ramachandran & Hubberd (2001), two items were conducted to discover if there are shape associations based on the package. Firstly, the participants were asked to indicate their association of the package with either a rounded or square package. Secondly, the 'Bouba' and 'Kiki' shapes were presented, where participants shared their association with either of the shapes. ($\alpha = .68$)

4 Results:

To be able to discover the effect of the independent variables 'package shape' and 'phonetics of the brand name' on the dependent variables 'basic tastes', 'product attitude', 'freshness', 'taste intensity', 'expected saltiness' and 'shape association', a multivariate analysis of variance (MANOVA) was conducted. In this analysis, the shape presented a significant effect ($F (9, 167) = 3.373$, $p < .0005$; Wilk's $\Lambda = .846$, partial $\eta2 = .154$), wherein the brand phonetics ($F (9, 167) = .834$, $p = .586$; Wilk's $\Lambda = .957$, partial $\eta2 = .043$) and the interaction effect between the variables ($F (9, 167) = .779$, $p = .636$; Wilk's $\Lambda = .960$, partial $\eta2 = .040$) both presented an insignificant effect. In Table 3, the descriptive statistics of the constructs are presented.

Table 3: *Descriptive statistics of the variables*

	Package shape		Brand phonetics	
Variable	Angular	Rounded	Angular	Rounded
Perceived sweetness	$M = 1.69$ $SD = .92$	$M = 1.6$ $SD = .95$	$M = 1.66$ $SD = .95$	$M = 1.59$ $SD = .93$
Perceived bitterness	$M = 1.31$ $SD = .64$	$M = 1.35$ $SD = .68$	$M = 1.33$ $SD = .69$	$M = 1.34$ $SD = .61$
Perceived sourness	$M = 1.53$ $SD = .84$	$M = 1.65$ $SD = .90$	$M = 1.57$ $SD = .89$	$M = 1.68$ $SD = .85$
Perceived saltiness	$M = 4.55$ $SD = .64$	$M = 4.35$ $SD = .81$	$M = 4.43$ $SD = .73$	$M = 4.40$ $SD = .81$
Product Attitude	$M = 3.34$ $SD = .98$	$M = 3.15$ $SD = .92$	$M = 3.29$ $SD = .93$	$M = 3.10$ $SD = .96$
Freshness	$M = 3.93$ $SD = .67$	$M = 3.75$ $SD = .84$	$M = 3.86$ $SD = .75$	$M = 3.74$ $SD = .83$
Taste Intensity	$M = 2.86$ $SD = .89$	$M = 2.92$ $SD = .98$	$M = 2.87$ $SD = .97$	$M = 2.94$ $SD = .93$
Expected saltiness	$M = 2.80$ $SD = .76$	$M = 2.57$ $SD = .77$	$M = 2.68$ $SD = .76$	$M = 2.61$ $SD = .79$
Shape Association	$M = 2.65$ $SD = .92$	$M = 2.10$ $SD = 1.06$	$M = 2.30$ $SD = 1.10$	$M = 2.29$ $SD = .95$

4.1 Basic tastes

As been mentioned before, the basic tastes have been measured individually. As been presented by the multivariate analysis, there was a neither a significant effect of shape on the perceived sweetness ($F(1,178) = .430$, $p = .5.13$) nor an effect of the brand name ($F(1,178) = .390$, $p = .533$). The interaction effect between the shape and the phonetics of the brand name on the perceived sweetness was not significant (F (1, 178) = 0.039, p = 0.843).

The effect of bitterness was insignificant by both shape ($F(1,178) = .133$, $p = .7.16$) and brand name ($F(1,178) = .008$, $p = .928$). In addition, no significant interaction effect between the shape and the phonetics of the brand name on the perceived bitterness was found (F (1, 178) = 0.008, p = 0.982).

The perception of sourness was insignificant by the shape ($F(1,178) = 1.355$, $p = .250$), brand name of the product ($F(1,178) = .629$, $p = .429$) and no interaction effect was found (F (1, 178) = 0.63, p = 0.43).

However, the shape of the package presented a marginally significant effect on the perceived saltiness ($F(1,178) = 2,987$, $p = .087$), wherein an angular package was perceived as saltier (M = 4.55; SD = .64) than the package with a rounded shape (M = 4.34; SD = .81). However, the brand name of the product presented an insignificant effect on the perceived saltiness ($F(1,178) = .403$, $p = .526$). The interaction effect between the shape and the phonetics of the brand name on the perceived saltiness was not significant (F (1, 178) = 0.40, p = 0.895).

4.2 Product attitude

Results showed that the shape of the package has an insignificant effect on the product attitude ($F(1,178) = 2.308$, $p = .130$). In addition, the brand name also showed an insignificant effect on the product attitude ($F(1,178) = 2.954$, $p = .087$. Finally, the interaction effect between the shape and the phonetics on the product attitude was not significant (F (1, 178) = 0.004, p = 0.95).

4.3 Freshness

The perceived freshness of the product presented a marginally significant effect on the shape of the product ($F(1,178) = .403$, $p = .087$). The angular package received a higher rating of freshness (M = 3.93; SD = .67) than the package with a rounded shape (M = 3.75; SD = .84). However, the freshness did not present a significant effect on the brand name of the product ($F(1,178) = 1,286$, $p = .258$). The interaction effect on the perceived freshness was presented as insignificant (F (1, 178) = .402, p = 0.527).

4.4 Taste intensity

The taste intensity did not present a significant effect on the shape of the product ($F(3,178) = .199$, $p = .656$). In addition, the taste intensity also did not show a significant effect on the brand name of the product ($F(3,178) = .38$, $p = .538$). Finally, no significant interaction effect between both on the taste intensity was found (F (1, 178) = 0.161, p = 0.689).

4.5 Expected saltiness

The expected saltiness presented a significant effect on the shape of the product ($F(3,178) = 4.51$, $p = .035$). The angular package was perceived to be saltier (M = 2.80; SD = .76) than the package with a rounded shape (M = 2.57; SD = .77). However, the effect of the brand name on the expected saltiness of the product was insignificant ($F(3,178) = .88$, $p = .35$). , the interaction effect between the shape and the phonetics on the expected saltiness of the product was also not significant (F (1, 178) = 0.118, p = 0.73).

4.6 Shape association

The shape of the product has a significant effect on the shape association of the product ($F(3,178) = 15.03$, $p = <0.001$). The angular package created a higher association with a square shape (M = 2,65; SD = .92). In congruence with that result, The rounded package presented a higher association with a round shape (M = 2.10; SD = 1.1). The effect of the brand name on the associated shape was insignificant ($F(3,178) = .0602$, $p = .804$).

      Additionally, a significant interaction effect between the shape and brand name is presented ($F(3,178) = 5.22$, $p = .023$). Here, the brand name consisting of rounded phonetics presented a higher association with a circle in combination with a rounded package (M = 1.82; SD = .17) than the combination of a rounded brand name with an angular package (M = 2.23; SD = 1.1). However, the angular brand name in combination with an angular package is perceived as less angular (M = 2.48; SD = .178) than the angular package in combination with a rounded name (M = 2.81; SD = .178). This effect is presented in Figure 6.

Figure 6: Interaction between the brand name and the shape on the shape association.
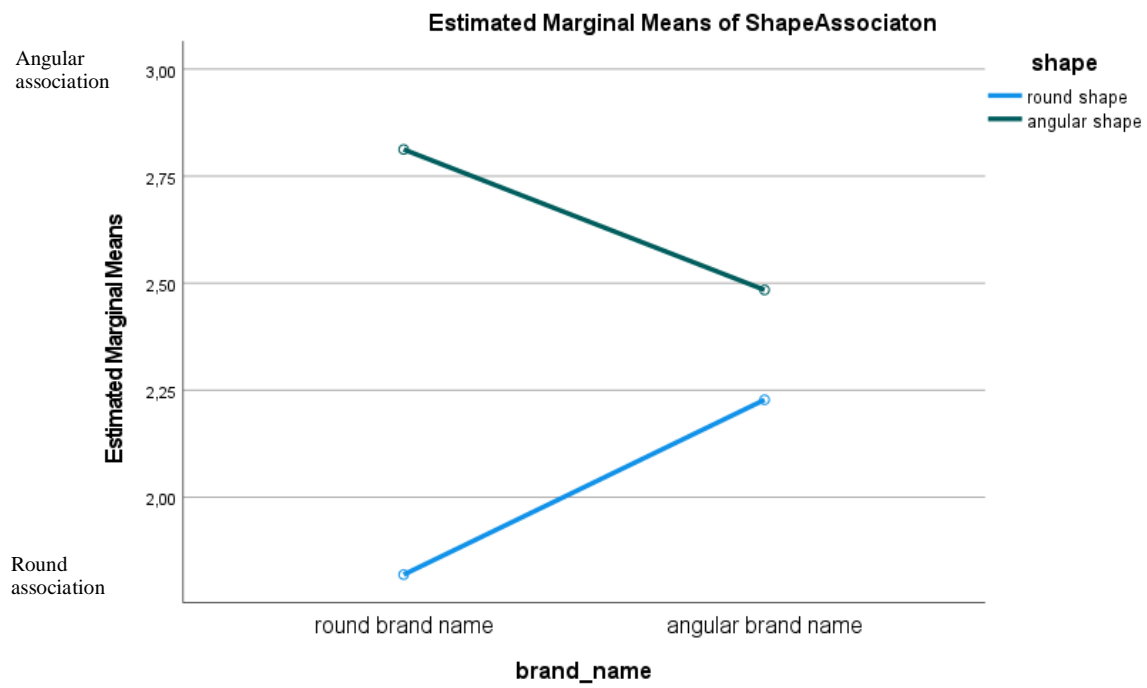
4.8 Hypotheses

In Table 4, an overview of the hypotheses with the outcomes based on the findings of the study is presented.

Table 4

Representation of the outcomes of the hypotheses

Hypotheses	Description	Outcome
H1	*A package with a rounded shape is perceived as less salty than a package with an angular shape.*	Supported
H2	*H2: A brand name based of rounded phonetics is perceived as less salty than a brand name based of angular phonetics.*	Not supported
H3a	*H3A: A combination of congruent cues (angular shape in combination with an angular name and a rounded shape in combination with a rounded name) results in a more positive product evaluation than an incongruent combination (angular shape in combination with a rounded name and a rounded shape with an angular name).*	Not supported
H3b	*H3B: A combination of an angular package and a brand name based of angular phonetics is perceived as saltier than a separation of an angular package and angular phonetics.*	Not supported

5 Discussion

This study aimed to investigate the effects of a package shape, an angular versus a rounded package, and the phonetics of a brand name, a brand name consisting of angular phonetics versus a brand name consisting of rounded phonetics, on the perceived saltiness of the product. It was expected that the rounded package was perceived as less salty than the angular variant. In line, it was also expected that the brand name based of rounded phonetics was perceived as less salty. In addition, it was expected that a combination of congruent cues results in a more positive product evaluation. Finally, it was expected that a combination of an angular package and a brand name based of angular phonetics is perceived as saltier than the opposing variants.

5.1 Discussion of the results

Firstly, the shape of the package marginally influenced the perception of saltiness. In addition, an effect of the shape of the package on the generally perceived saltiness was found. In both circumstances, the angular package was perceived as saltier than the rounded alternative. This is in line with the results from Velasco et al. (2014), who presented that angular shapes are often related to saltiness, while rounded shapes are related to sweetness. However, contrary to the study of Velasco, the results did not present that rounded shapes were perceived as sweeter. A logical explanation of this would be the general view of consumers, who rarely associate chips as sweet. In addition, the shape of the package presented a marginal effect on the perceived freshness of the product. This could be because of prior experiences of customers with products. Nevertheless, the significant results support the first hypothesis, namely that a package with a rounded shape is perceived as less salty than a package with an angular shape.

Secondly, the research the brand phonetics did not impact the perceived saltiness of the product. This result is contrary to the results of the study of Gallace et al. (2010), who showed that words consisting of angular phonetics are associated with saltiness, while words consisting of rounded phonetics are associated with sweetness. The second hypothesis, namely that a brand name based of rounded phonetics is perceived as less salty than a brand name based of angular phonetics, is not supported by the results of this study.

Thirdly, based on the Cue Consistency Theory of Maheswaran and Chaiken (1991) and the thereafter following studies on the congruence of implicit and explicit cues on packages, it was expected that a combination of congruent cues results in a more positive product evaluation. Unfortunately, the results of this research did not support this hypothesis. Since the participants evaluated the angular brand name as more suitable, it might be that "Nabbis" was perceived as less appealing by the participants, thus leading to a negative influence on the product attitude and influencing the congruency. This point in question was also presented in the Cue Consistency Theory (1991) since a disbalance in cues could lead to a decrease incongruency and thus leading to a lower product evaluation, which could explain this occurrence.

Furthermore, it was expected that a combination of an angular package and a brand name based of angular phonetics is perceived as saltier than the opposing variants. Based on the results of this study, no influence of congruent cues on the perceived saltiness of the product is apparent.

Lastly, multiple constructs have been created to discover other possible effects of the package shape and brand phonetics. Unfortunately, the majority of these assemblies, namely the preference for savoury food and the taste expectation, were not supported by the study. However, the package shape showed an impact on the shape association. Here, the participants indicated that they associated the round package with a rounded shape, while the angular package was associated with an angular shape. This was measured with the shapes that were also used in the experiments of Newman (1933) and Ramachandran & Hubberd (2001). More relevant here is the outcome of the effect of the brand phonetics, which did not present an impact. Unfortunately, where participants were able to successfully associate the shapes with the names during the preliminary test, the participants of the main study were unable to associate these shapes successfully. The results of this experiment are contrary to the outcomes of Newman (1933), Ramachandran & Hubberd (2001), Köhler (1929) and Belli (2001), where the participants were able to assess a word consisting of rounded phonetics with a round shape and a brand name consisting of angular phonetics with an angular shape. However, an effect of the shape of the package and the brand name on the shape association has been discovered. More specifically, the rounded brand name "Nabbis" appeared to support the shape association of the participant, wherein the angular brand name "Krusty" seemed to create a lesser effect. Based on this outcome, it appears that "Nabbis" either strengthens the shapes or rather adopts a more passive role on the package and gives the customer the opportunity to focus more on the shape. Since the brand name did not have any effects on the liking of the package nor on the taste evaluations, it does not seem that "Nabbis" is just perceived as more pleasant. Therefore, it is possible that "Nabbis" is perceived as a more passive name and offers the other package cues to fulfil a greater role.

5.2 Theoretical and practical implications

Based on the results of this study, theoretical and practical implications are distinguished. From a theoretical perspective, this study could marginally fill in the current deficiency on the effect of package shape on the perceived saltiness of the product, since the results present that an angular package is perceived saltier than a rounded version. This offers a new perspective since current research is mainly focused on the influence of shape on other tastes (Montejo et al., 2013) or on the perceived intensity (Van Rompay et al., 2010). In addition, the outcomes of the influence of the package on the perceived saltiness are in line with prior studies, for instance, Velasco et al. (2014).

The results of this study also presented practical implications for chips packages. As been presented in the marketing mix (Singh, 2012), the product fulfils a primary function to convince the customer to support the brand. This study provides suggestions for product packaging designers, food corporations, marketing organizations and brand managers to adjust their product package to influence the perception of saltiness. Theoretically, the degree of salt in the product could be lowered without changing the perception of the consumer by utilizing an angular package. Since the high daily intake of salt is a global pressing issue, this implementation might also be of interest for the World Health Organization or similar organizations with a focus on improvements of health.

5.3 Limitations

It is apparent that it is important to address the limitations, shortcomings and future recommendations of this study. The first limitation that arguably had the greatest impact on the quality and reliability of the data provided by the participants in the online setting of the questionnaire. Usually, experiments that involve association with taste are conducted in a real-life setting, where the participants have the opportunity to taste the subject of analysis and provide data based on their feelings. These experiments were often conducted in crowded public spaces since the goal was to gather as many participants as possible. However, due to the global COVID-19 pandemic and the restrictions that accompanied it, it was difficult to arrange this setting and besides, it would not feel responsible. As a result of the online experimental environment, participants were not able to taste the chips but instead asked what taste they would have expected. This ultimately could be the cause of the insignificant data for the research.

Another shortcoming of this experiment is the size of the sample group. In this experiment, 179 participants sufficiently completed the questionnaire. Although this is a reasonable rate of response that could provide sufficient data, a higher amount of participants would lead to richer data, which is more beneficial for the experiment. Furthermore, another limitation that was apparent during the research was the distribution between the four different package designs. The 26 participants that started the questionnaire without finishing it were counted in the dividing of the package designs, which lead to a great difference between the data gathered with every package. The first package received 79 responses, while the other three respectively received 36 and both 32 responses. This issue

could have possibly influenced a disbalance of the quality and reliability of the data and it would be advised to monitor this carefully in future experiments.

Lastly, for this experiment, two brand names and chips packages were designed to measure the influence of it on the perceived saltiness. To prevent bias towards the products and to focus on the measures of the research, the brand names were fabricated and the design of the package included as few visual elements as possible. However, as been presented in the outcomes of the preliminary test, these designs and brand logos were perceived as cheap and unrealistic. Since cheap chips are often negatively related to healthiness, this might have influenced the perception of the participant. Additionally, the colour of the package might have influenced the participants, since it was decided to choose a rather intense red colour, often used as the recognizable colour of the natural variant of chips. This might have resulted in a bias of the participant. Furthermore, as been presented by Spence and Velasco (2018), the packaging colour creates a range of sensory and brand-related product expectations in the mind of the consumer, which indicates that the participants could already have an expectation based on the colour of the product.

5.4 Future research

Since the amount of research conducted on the influence of intrinsic and extrinsic cues of a package on the perceived saltiness is limited, it is advised to continue on this topic. Especially considering the urge to lower the daily salt intake and the research that has already been conducted on the influence of a design factor on the healthiness, intensity and taste of a product, it is possible that consumers could perceive less salt through package cues. When conducting future research, it is primarily advised to conduct these experiments in physical settings, since this would provide the most optimal data. Besides, since there are numerous products that consist of a great amount of salt, it might be of interest to look into different products, for instance, soup, cheese or bread. Since these products are generally consumed on a daily basis, the impact of changing the amount of salt in these products would be greater. Here, it is expected that the shape of the package influences the perception of the product. However, as bread is generally prepacked in a standardized matter, it might be of interest to discover if a different package alters the perception of the product.

Since the average age of this research was 27, which could be perceived as rather low, it might be of interest to discover the perception of the older and younger sample groups and the difference between the age groups. In the research of Stein, Cowart and Beauchamp (2012), findings suggested that an early dietary experience fulfils an influential role of shaping salty taste responses of infants and young children. Therefore, it might be of interest to discover if a combination of salt reduction with a package that intensifies the taste has an influence on the younger generation, so we focus on changing their salt expectations of products.

Secondly, since there is a great amount of possible visual cues on a package, it might be of interest to discover the influence of other package cues. For instance, since the colour of a package influences the product expectation and perception (Spence & Velasco, 2018), the influence of the

colour hue of the package could be of interest. Additionally, as been presented by Van Rompay, Finger, Saakes and Fenko (2017), the texture of the package influences the taste intensity of the product, wherein the rounded texture was perceived as sweeter and the rough texture as more intense. Therefore, it could be of interest to discover the influence of other package cues.

6 Conclusion

The aim of this study was to investigate the effects of a package shape and the phonetics of a brand name on the perceived saltiness of the product. With the use of a 2x2 experimental research design, this study was conducted to answer the main research question: "*To what extent do the shape of the package and the phonetics of the brand name influence the perceived saltiness of the product*".

Despite the fact that the majority of the results presented an insignificant effect, the study still contributes to the current field of research on the influence of package cues on the perceived taste by the consumer. The study presented that the shape of a package influences the perception of saltiness, wherein an angular package is perceived by the participants as saltier than a rounded package. However, contrary to prior literature, the results presented that the phonetics in the brand name did not influence the perceived saltiness. Therefore, to answer the research question, the shape of a package influences the perceived saltiness, while the phonetics of the brand name does not show an influence. This result offers the opportunity to discover the influence of other shapes and to conduct brand names with other phonetics to see if the results differ.

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Appendices

Appendix A: Results of preliminary test:

Table A1:
Means and standard deviation angular brand name association with saltiness

Variable	N	*M*	*SD*
Brand 1: TukTuk	20	3.00	1.48
Brand 2: Krusty	20	2.8	.93
Brand 3: Tucky	20	2.00	0.89
Brand 4: Terra	20	4.15	1.49
Brand 5: Crunky	20	3.05	1.24

Table A2:
Means and standard deviation round brand name association with saltiness

Variable	N	*M*	*SD*
Brand 1: Beam	20	3.61	1.01
Brand 2: Mahuma	20	3.89	1.37
Brand 3: Bamble	20	2.72	1.04
Brand 4: Nabbis	20	1.50	.83
Brand 5: Balley	20	3.28	1.33

Table A3:
Means and standard deviation angular brand name association with healthiness

Variable	N	*M*	*SD*
Brand 1: TukTuk	20	2.74	1.02
Brand 2: Krusty	20	4.05	1.32
Brand 3: Tucky	20	3.00	.79
Brand 4: Terra	20	1.37	.98
Brand 5: Crunky	20	3.84	1.04

Table A4:
Means and standard deviation round brand name association with healthiness

Variable	N	*M*	*SD*
Brand 1: Beam	20	3.42	1.27
Brand 2: Mahuma	20	1.89	1.25
Brand 3: Bamble	20	2.79	1.40
Brand 4: Nabbis	20	3.74	1.21
Brand 5: Balley	20	3.16	1.18

Table A5:
Means and standard deviation angular brand name association with blandness

Variable	N	*M*	*SD*
Brand 1: TukTuk	20	3.06	1.26
Brand 2: Krusty	20	3.53	1.38
Brand 3: Tucky	20	3.06	1.21
Brand 4: Terra	20	2.00	1.28
Brand 5: Crunky	20	3.35	1.41

Table A6:
Means and standard deviation round brand name association with blandness

Variable	N	*M*	*SD*
Brand 1: Beam	20	2.75	1.39
Brand 2: Mahuma	20	3.00	1.50
Brand 3: Bamble	20	2.75	1.39
Brand 4: Nabbis	20	3.06	1.68
Brand 5: Balley	20	3.44	.86

Table A7:
Means and standard deviation angular brand name association with unhealthiness

Variable	N	*M*	*SD*
Brand 1: TukTuk	20	3.41	.84
Brand 2: Krusty	20	1.94	1.16
Brand 3: Tucky	20	3.35	.97
Brand 4: Terra	20	4.41	1.19
Brand 5: Crunky	20	1.88	.96

Table A8:
Means and standard deviation round brand name association with unhealthiness

Variable	N	*M*	*SD*
Brand 1: Beam	20	3.13	1.49
Brand 2: Mahuma	20	3.69	1.40
Brand 3: Bamble	20	2.88	1.11
Brand 4: Nabbis	20	2.44	1.41
Brand 5: Balley	20	2.88	1.32

Table A9:
Means and standard deviation most-fitting angular name for a chips brand

Variable	N	M	SD
Brand 1: TukTuk	20	3.50	1.12
Brand 2: Krusty	20	2.17	.96
Brand 3: Tucky	20	2.44	1.17
Brand 4: Terra	20	4.5	1.12
Brand 5: Crunky	20	2.39	1.16

Table A10:
Means and standard deviation most-fitting round name for a chips brand

Variable	N	M	SD
Brand 1: Beam	20	3.83	1.26
Brand 2: Mahuma	20	3.11	1.49
Brand 3: Bamble	20	3.06	1.27
Brand 4: Nabbis	20	1.67	1.05
Brand 5: Balley	20	3.33	.94

Appendix B: Approval form of ethics committee University of Twente

UNIVERSITY OF TWENTE.

APPROVED BMS EC RESEARCH PROJECT REQUEST

Dear researcher,

This is a notification from the BMS Ethics Committee concerning the web application form for the ethical review of research projects.

Requestnr. :	210678
Title :	?The influence of a package shape and a brand name on the perception of saltiness of chips?
Date of application :	2021-04-19
Researcher :	Botter, M.A.
Supervisor :	Galetzka, M.
Commission :	Vries, P.W. de
Usage of SONA :	N

Your research has been approved by the Ethics Committee.

The BMS ethical committee / Domain Humanities & Social Sciences has assessed the ethical aspects of your research project. On the basis of the information you provided, the committee does not have any ethical concerns regarding this research project.

It is your responsibility to ensure that the research is carried out in line with the information provided in the application you submitted for ethical review. If you make changes to the proposal that affect the approach to research on humans, you must resubmit the changed project or grant agreement to the ethical committee with these changes highlighted.

Moreover, novel ethical issues may emerge while carrying out your research. It is important that you re-consider and discuss the ethical aspects and implications of your research regularly, and that you proceed as a responsible scientist.

Finally, your research is subject to regulations such as the EU General Data Protection Regulation (GDPR), the Code of Conduct for the use of personal data in Scientific Research by VSNU (the Association of Universities in the Netherlands), further codes of conduct that are applicable in your field, and the obligation to report a security incident (data breach or otherwise) at the UT.

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Appendix C: The questionnaire of the main study

Table C1:

Questions of the main questionnaire per construct

Construct	Question/statement
Demographics	What is your gender?
	What is the highest level of education you have finished?
	What is your age?
	Where are you from?
	How often do you consume chips?
	I consider myself a sweet tooth
	I have a preference for savoury food
	I prefer salty food over sweet food
Basic tastes	I expect the chips to taste sweet
	I expect the chips to taste bitter
	I expect the chips to taste sour
	I expect the chips to taste salty
Expected saltiness	I expect the chips to taste salty
	The chips are saltier than regular ones
	The brand name makes me believe the chips are salty
	The brand name makes me believe the chips are saltier than regular ones
	The package shape makes me believe the chips are salty
	The package shape makes me believe the chips are saltier than regular one's
Freshness	I expect the chips to be crispy
	I expect the chips to be fresh
	I expect the chips to be crunchy
Taste intensity	I expect the chips to taste strong
	I expect the chips to taste intense
	I expect the chips to taste bland
Product attitude	In general, I would like these chips
	I like the packaging of the chips
	I would buy the chips in a grocery store
Shape association	Based on the package, please indicate which shape you associate with the chips (low value = round, high value = angular)
	Based on the package, please indicate which shape you associate with the chips (low value = rounded 'Bouba' shape, high value = angular 'Kiki' shape)