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The influence of packaging visual design on consumer food product choices

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Abstract

Previous research reported on the significant role that packaging visual elements play in food context. Still, little is known about how typeface design can influence consumer expectations and stimulate their food choices in the case of spices. Thus, the present study aimed to investigate the influence of packaging typeface on the consumers' selection of spice and their expectations of its quality. The first part of the study was an online experiment in which participants were presented with packaging that differed in visual elements, namely typeface (sans-serif, handwritten) and ingredient depiction (photo, illustration, without depiction). The second part of the study was conducted in a laboratory setting where participants viewed packaging that varied in typeface and flavor (red pepper, dried basil), and explained their reasons for selecting a particular packaging. The results showed that typeface influenced the participants' choices and their expectations. The first experiment revealed that the effect of the typeface occurs only in the presence of ingredient depiction (either photo or illustration), while the second experiment indicated that the participants' expectations of spice quality were based on the perceived typeface legibility. This implies that a legible typeface on food packaging can be a useful tool for attracting consumers' attention and stimulating their choices of food products.

Keywords: packaging, typography, consumer behavior, legibility, graphic design

1. Introduction

Food packaging has a great potential to serve as a medium for food-related information. All the information, both pictorial and textual, attracts the attention of a consumer and can arouse the desire to buy the food product (Wyrwa and Barska, 2017). When making a buying decision, consumers mostly rely on the packaging visual design and their expectations about the product quality. Finding out how appropriate particular visual elements are on food packaging, is key for successful packaging design in terms of the consumers' food buying choice. So far, previous research into food packaging explored this to some extent.

Hamlin (2016) found that graphic design had an impact on food product choices. Silayoi and Speece (2004) reported that positive influence of visual elements on food choice is more evident in low-involvement situations. Abrams, Evans and Duff (2015) found that visual design was especially important when making quick buying decisions. The influence of graphic elements was also confirmed by Liao, et al. (2015) who compared different types of emotional responses to packaging visual elements. Later, Lidón, et al. (2018) revealed that the visual appearance of a particular element (i.e. product depiction) had an impact on product liking and willingness to buy. The influence of an isolated visual element was recently investigated by Vila-López, Kuster-Boluda and Alacreu-Crespo (2021). They found that variations in design, such as in the color of the label, affected participants' food selection. This was in line with the findings of Van der Laan, et al. (2012) who reported on the attractiveness of the packaging visual design as a strong predictor of food choice. In the study by Peters-Texeira and Badrie (2005) the majority of participants (85.4 %) reported that the packaging attractiveness influenced their choice of food product in the same product category. Taken together, all these findings confirm Cardello's (1994) suggestion that the

visual appearance of the food itself has a powerful impact on its acceptability, but that the visual appearance of its packaging is equally important.

Besides the investigation of consumers' food choices, previous researches were also focused on the consumers' perception of food quality under the influence of packaging characteristics. In a study (Konstantoglou, Folinas and Fotiadis, 2020) that investigated consumers' attitudes toward food packaging, the results indicated that consumers recognize the importance of packaging's role in food protection and that quality of food is associated with the quality of its packaging. The perceived quality of a food product was measured for different product types, such as snacks (Wang, 2013), chocolate (De Kerpel, Kobuszewski Volles and Van Kerckhove, 2020), yogurt (Becker, et al., 2011), mousse, pasta (Simmonds, Woods and Spence, 2018), cheese (Bou-Mitri, et al., 2021), carrots (Nørgaard Olesen and Giacalone, 2018) and drinks (Gislason, et al., 2020; Włodarska, et al., 2019). However, there are some food product categories that have been neglected by the packaging researchers. When it comes to perceived food quality, spices are one of the categories, which are worth investigation and have not been studied yet.

Most of the above-mentioned studies used either product choice or perceived quality as dependent variables, while independent variables resulted from variations in the packaging visual elements. For example, Gislason, et al. (2020) varied color and label design elements, such as shape and complexity, to investigate the consumers' expected quality of beer. In a study, which investigated the influence of packaging design on yogurt evaluation (Becker, et al., 2011), the packaging designs varied in shape and color saturation. Some of the researchers varied the position of special visual elements such as transparent windows, and investigated its influence on the expected quality (Simmonds, Woods and Spence, 2018). De Kerpel, Kobuszewski Volles and Van Kerckhove (2020) examined the effect of variations in packaging surface (glossy versus matte) on the perception of chocolate quality. In a study of packaged tea, Kovačević, Brozović and Itrić Ivanda (2019) used variations in eco-mark design and its position on the front side of the packaging. Similarly, Magnier, Schoormans and Mugge (2016) used the AB ("agriculture biologique") logo on coffee packaging to examine its effect on consumers' perceived quality of the product. Nørgaard Olesen and Giacalone (2018) focused on fresh food. They used a systematic variation of label color and packaging type to explore their influence on participants' perception of quality of fresh carrots.

Despite the number of visual variables included in previous research, only a few food packaging studies considered typeface as an independent variable. In a study that examined the effects of two different typefaces weights (Karnal, et al., 2016), the results suggested that typeface associations can influence the perception of product healthiness. Liao, et al. (2015) used two different typefaces (simple versus ornate) to examine whether the typeface can affect people's emotional responses towards chocolate packaging. The packaged chocolate was also investigated by Kovač, et al. (2019) who included the typeface as one of the independent variables in their study of consumer preferences.

Other studies were mainly focused on the participants' expectations about the taste based on the typeface visual characteristics (for example, Otterbring, et al., 2022). Velasco, et al. (2014) combined different typefaces with other packaging attributes and found that a rounded typeface can communicate sweet tastes better than angular typeface. Furthermore, it was found that visual properties of a typeface can be associated with basic taste attributes (sweet, bitter, and sour) and have an impact on the actual taste ratings (Velasco, Hyndman and Spence, 2018). These studies presented relevant findings on the role of typeface in transmitting messages regarding food taste. However, the influence of typeface on the consumers' expectations of the food quality is still insufficiently examined.

In the context of food packaging, visual characteristics of a typeface not only influence associations created in the consumers' minds, but also the correct identification of letters. In order to have any effect on the consumer, a typeface has to be legible. The legibility is a desirable aspect of any textual information, and food products are not an exception. This was confirmed in the previous study of SMEs food products (Saad and Idris, 2014). Our study went further in the examination of the effects of typeface and included the perceived legibility of typeface as a potential moderator in generating positive impressions about food quality.

The scope of this paper is even broader. The main purpose of our study was to fill the research gaps in the area of visual design and food packaging. The aim was to investigate the influence of the packaging typeface on the consumers' food product choices and their expectations about the product quality by conducting two experiments. The first experiment was conducted online. Its goal was to collect basic data about the consumers' spice buying habits and their gravitation to particular visual elements on the spice packaging design. The second experiment was conducted in the laboratory setting and its goal was twofold; (1) to examine whether the influence of typeface remained the same when the experimental procedure changed and (2) to get a wider picture regarding the consumers' attitudes toward the spice packaging by collecting qualitative data.

2. Experiment I

For the first experiment, an online questionnaire was used. The online questionnaire was used in a number of recent packaging-oriented studies (Hall, et al., 2021; Poslon, Kovačević and Brozović, 2021; Taillie, et al., 2020; Kovač, Brozović and Itrić Ivanda, 2019) and it was appropriate for our first experiment to get a quick collection of responses. The study was conducted during May 2021 using Google Forms. A web link to the questionnaire was sent via e-mail using the authors' personal databases. The respondents were adult consumers (n = 154) residing in Croatia, who agreed to participate in the study. They were fully informed about the nature of the study and that anonymity was assured. Their age ranged from 19 to 57 years (M = 24.04, SD = 6.65); 76.62 % were women. In most households in Croatia, females are responsible for food purchases, so the sample was appropriate for the investigation of the food selection in our experiment.

2.1 Design of the packaging samples

Given that the main independent variables were based on visual stimuli, special care was given to the visual appearance of the packaging variants in the experiment. The design of the packaging samples and the selection of visual elements were driven by literature review. As suggested by Kovačević, Brozović and Banić (2020), all packaging samples had a symmetrically balanced composition, a high contrast between the text and the background and a clear visual hierarchy of information. The font size was in accordance with European Parliament and Council Regulation (EC) 1169/2011 (2011) which specifies that x-height of the letters shall be 1.2 mm or greater. Two typefaces were used for the manipulation of the typeface variable; Arial as the sans-serif typeface, and Brush Script MT as the handwritten typeface. These two typefaces were chosen because they significantly differ in their visual appearance. They were used across many studies of people's responses to textual stimuli. For example, in order to manipulate text legibility in learning materials, Eitel and Kühl (2016) used Arial for a legible (fluent) version of text and Brush Script MT for a less legible (disfluent) version. Based on the pretest for the main experiment, which examined printed questions, Song and Schwarz (2008) also used Arial for easy-to-read conditions and Brush Script MT for difficult-to-read conditions. In the same manner, these typefaces were used in the study of the book review by Chen and Sakamoto (2016) and Mantonakis, et al. (2013) who investigated the effect of fluency on product judgment.

Photos and illustrations were used for the different styles of spice depiction. Both types of depiction were commonly used in similar packaging studies to present the ingredients (Hall, et al., 2021; Abrams, Evans and Duff, 2015; Lidón, et al., 2018; Timmerman and Piqueras-Fiszman, 2019; Kovač, et al., 2019). According to the European Parliament and Council Regulation (EC) 1169/2011 (2011), food depiction is not mandatory for spices. If used as voluntary food information, pictorial information shall not be displayed in such a way that detriments the presentation of mandatory information (i.e. the name of the food). This guideline was taken into account in the process of designing the packaging samples.

The design (Figure 1) was created by a professional graphic designer (one of the authors) who used the most common packaging design for spices in Croatia as a reference for the design of the packaging samples

Figure 1: Packaging samples used in Experiment I: (a) without depiction, sans-serif; (b) photo, sans-serif; (c) illustration, sans-serif; (d) without depiction, handwritten; (e) photo, handwritten; (f) illustration, handwritten

(i.e. pictures of stand-up pouches) in this study. Stand-up pouches are considered to be suitable for red pepper and for ground spice powders (King, 2006). If laminated, the pouches can be especially useful for the protection of the spice phenol content which is associated with spice antioxidant activity (Asimovic, et al., 2014).

2.2 Procedure

The questionnaire consisted of three sections. Besides the basic socio-demographic variables, the first section inquired about the respondents' spice buying habits by asking the closed-ended question "How often do you buy spices?" in which the respondents selected one option among a predefined list. The options were: "Never", "Once a year", "Several times a year", "Once a month".

The second section inquired about the respondents' preferences for different packaging samples. In total, there were six packaging samples (Figure 1). They were grouped in three pairs based on spice depiction; a pair without depiction, a pair with a photo, and a pair with an illustration. Each pair consisted of a packaging with the sans-serif and handwritten typefaces. The order of presenting the packaging samples was randomized for each respondent. The respondents were asked to choose one packaging in each pair that they expected to have a better quality of spice.

In the third section a general selection task was used in order to investigate the respondents' preferences for a particular depiction style. All six packaging samples were presented to the respondents and they were asked to select the one that they expected to have the highest spice quality.

2.3 Results and discussion on Experiment I

2.3.1 The influence of typeface

For each packaging pair presented to the participants in the selection task, the McNemar's test was performed to investigate the influence of typeface on the participants' choices (Table 1). The McNemar's test was used since the purpose of the analysis was to compare paired samples using nominal dichotomous data and to determine significant differences in the frequency of selection for a particular item (Kovačević, Brozović and Banić, 2020; Kovačević, Brozović and Itrić Ivanda, 2019; McCrum-Gardner, 2008). The results showed a significant difference in the participants' selection of the packaging with the photo ($p < 0.001$), indicating that spice in the packaging with a combination of the photo and sans-serif typeface was perceived to have better quality (66.9 %) than the spice in the packaging with the combination of the photo and handwritten typeface (33.1 %). The results for the packaging samples with the combination of illustration and the two different typefaces also showed the participants' inclination toward the sans-serif typeface. Significantly more participants (70.1 %) expected that the spice in the packaging with the combination of the illustration and sans-serif typeface had better quality than the spice in the packaging with the combination of the illustration and handwritten typeface (29.9 %), $p < 0.001$. This finding was surprising, because the style of the typeface is considered to be more harmonious with the style of the illustration. For the pair of packaging without any spice depiction, the results showed no significant effect of the typeface on the participants' choices ($p = 0.171$).

Table 1: The participants' selection of spice packaging across conditions (p is based on McNemar's test)

Packaging spice depiction	Packaging typeface	*n*	%	*p*
None	Sans-serif	86	55.8	0.171
None	Handwritten	68	44.2	
Total		154	100.0	
Photo	Sans-serif	103	66.9	0.000
Photo	Handwritten	51	33.1	
Total		154	100.0	
Illustration	Sans-serif	108	70.1	0.000
Illustration	Handwritten	46	29.9	
Total		154	100.0	

Additionally, we wanted to investigate whether the preferences for different packaging samples differed across the participants with different buying habits (i.e. self-reported frequency of buying spices in their everyday life). The results were split in four categories: "Never", "Once a year", "Several times a year" and "Once

Table 2: Results of the McNemar's tests for sans-serif vs. handwritten split by participants buying habits (asterisks indicate statistically significant differences between the groups)

Frequency of buying spices	*n*	Packaging without spice depiction	Packaging with illustration	Packaging with photo
Never	15	$p = 0.118$	$p = 0.055$	$p = 0.118$
Once a year	44	$p = 0.651$	$p = 0.291$	$p = 0.024$*
Several times a year	59	$p = 0.193$	$p = 0.037$*	$p = 0.009$*
Once a month	36	$p = 0.617$	$p = 0.005$*	$p = 0.005$*

a month". The McNemar's test showed no significant differences in choices between sans-serif and handwritten typeface for packaging samples without spice depiction across all categories (Table 2). However, for the packaging that contained the illustration of the ingredient, significant differences were found in the categories "Several times a year" ($p < 0.05$) and "Once a month" ($p < 0.05$), indicating that the participants who buy spices often, perceived the packaging with the sans-serif typeface to have a better quality of spice. For the packaging that contained a photo of the ingredient, significant differences were found in three categories: "Once a year", "Several times a year" and "Once a month" (all values $p < 0.05$), indicating that the participants who buy spices at least once a year expected that the spice in the packaging with the sans-serif typeface had a better quality. Any further interpretation of the results for the buying frequency categories should be taken with caution due to the small sample.

2.3.2 Preferences for product depiction style

In the general selection-task, the participants selected one packaging among all the packaging samples used in this experiment. The frequencies of selection for each packaging sample are shown in Table 3.

Table 3: The frequencies of selection of each packaging sample in general selection-task

Packaging spice depiction	Packaging typeface	*n*	%
None	Sans-serif	27	17.5
None	Handwritten	8	5.2
Photo	Sans-serif	46	29.9
Photo	Handwritten	27	17.5
Illustration	Sans-serif	32	20.8
Illustration	Handwritten	14	9.1
Total		154	100.0

In order to investigate whether the participants differed in their preferences for a particular depiction style (i.e. illustration or photo), a McNemar's test was performed only on the results of the participants who chose the packaging with the spice depiction ($n = 119$). The results showed that the participants chose the packaging with the photo more frequently (61.34 %) than the packaging with the illustration (38.66 %), $p < 0.05$, suggesting that the participants prefer realistic presentations of the ingredient in presenting the quality of spice. This is in line with earlier studies which demonstrated the consumers' inclination towards photographic representations of the product. For example, in a study by Kobayashi and Benassi (2015) who investigated the impact of coffee packaging characteristics on consumers' purchase decisions, participants preferred an enriched photo of the coffee drink rather than a drawing. Similar conclusions were reached by Kovač, et al. (2019) who examined the effects of different visual elements on strawberry chocolate packaging and reported that participants preferred a photo of the strawberry over an illustration. Their results suggest that a photo presents the ingredient more realistically than the illustration, which gives consumers a feeling of reliability. According to advertising research, unrealistic images should be avoided if marketers strive to maximize the perceived benefits of a product (Kim, Choi and Wakslak, 2019).

We used the results of the first experiment as the basis for the design of the second experiment. Firstly, the effect of the typeface was noticeable only in the groups of participants who buy spices at least once a year. According to this finding, the recruitment criterion for participants in the second experiment was that they buy spices frequently. Secondly, the effect of the typeface was significant only in the presence of spice depiction. Thirdly, when comparing the two types of spice depiction, the participants preferred the photo over the illustration. In line with these results, the stimuli used in the second experiment were packaging with a photographic image of the spices.

3. Experiment II

A face-to-face interview, including the participants' subjective ratings of the packaging samples, was used for the second experiment. It took place in an experimental room at the University of Zagreb, Faculty of Graphic Arts. In comparison to the online collection of data for the Experiment I, this method provided better control over the viewing conditions for each participant and enabled us to get additional qualitative data. The participants were adult Croatian consumers ($n = 60$), who claimed that they buy spices several times a year. All the participants signed their written consent prior to taking part in the study. Their age ranged from 24 to 80 years ($M = 43.07$, $SD = 13.73$); 68.3 % were women. The experimental procedure received approval from the Ethics Committee of the Faculty of Graphic Arts, University of Zagreb (approval reference number 641-01/21-01/1).

3.1 Design of the packaging samples

The design of the packaging samples was based on the same principles as in Experiment I. In Experiment II only packaging samples with a photo depiction were used. Packaging for a new spice flavor (i.e., dried basil) was added. In order to control the variables, the design of the basil packaging was consistent with the packaging for the red pepper. Only the product-related information was changed (i.e., the spice name,

the background color and the photo of the spice). Two packaging variables were manipulated: typeface (sans-serif versus handwritten) and flavor (red pepper versus dried basil), which resulted in four different packaging samples (Figure 2).

3.2 Procedure

The participants took part in the experiment one by one. They were seated in front of a computer screen (Lenovo computer display LEN L1900pA, with a resolution of 1280 × 1024 pixels) at the approximate distance of 70 cm. Pictures of packaging samples (Figure 2) were presented on screen.

In the first section of questions, the participants were instructed to view the packaging samples individually and rate the expected spice quality for each of them. A 7-point scale was used, ranging from "unacceptable quality" (1) to "high quality" (7). There was no time limitation in completing the task.

In the second section of questions, they were asked to rate the legibility of the product's name for each packaging. A 7-point scale was used again, ranging from "unacceptable legibility" (1) to "high legibility" (7). The order of presenting the packaging samples was counterbalanced for participants.

In the third section, we used selection tasks similar to those in Experiment I. In Experiment II, the purpose of the selection tasks was twofold. Firstly, we wanted to investigate whether the influence of the typeface remains the same if a new spice type (i.e., dried basil) is taken into consideration. Secondly, participants were asked to justify their choices and explain their reasons for particular choice decisions during the selection tasks. For the selection task, the packaging samples were grouped in two pairs; a pair of packaging for the red pepper and a pair of packaging for dried basil. Each pair consisted of packaging with the sans-serif and handwritten typefaces. The participants were asked to select one packaging in each pair that they expected to have a better quality of spice. Their comments were recorded by an interviewer.

At the end of the interview, the participants were asked "When buying spices, which visual information on the packaging do you pay more attention to: textual or pictorial?". The purpose of this extra question was to investigate if the text-oriented and the picture-oriented participants differ when associating spice quality with typeface legibility, since it is known that the way in which consumers process information can affect the impact of visual design cues on food choices (Vermeir and Roose, 2020).

3.3 Results and discussion on Experiment II

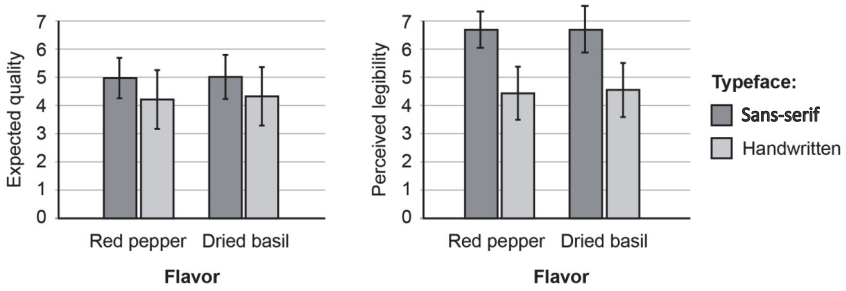
3.3.1 The influence of typeface and flavor on expected quality

A repeated measures analysis of variance (ANOVA) was used to examine the influence of typeface (sans-serif versus handwritten) and flavor (red pepper versus dried basil) on the expected quality of spice. There was a significant effect of typeface on the expected quality, $F(1, 59) = 31.96$, $p < 0.001$, indicating that the spice in the packaging with the sans-serif typeface was expected to have better quality ($M = 5.00$, $SD = 0.76$) than the spice in the packaging with the handwritten typeface ($M = 4.28$, $SD = 1.03$). Figure 3 shows the results. This was in accordance with the results of the first experiment. There was no significant effect of flavor on the expected quality ($p > 0.05$) and no (typeface vs. flavor) interaction effect ($p > 0.05$). This suggests that changing the product type in our second experiment did not affect the participants' responses regarding the perceived quality of the spice.

3.3.2 The influence of typeface and flavor on legibility

To investigate the influence of typeface (sans-serif versus handwritten) and flavor (red pepper versus dried basil) on the perceived legibility, a repeated measures ANOVA was used. As expected, there was a significant effect of typeface on the legibility ratings, $F(1, 59) = 406.98$, $p < 0.001$, indicating that the sans-serif typeface was evaluated as more legible ($M = 6.65$, $SD = 0.72$) than the handwritten typeface ($M = 4.48$, $SD = 0.94$). No significant effect of flavor on the legi-

Figure 2: Packaging samples used in Experiment II: (a) red pepper, sans-serif; (b) dried basil, sans-serif; (c) red pepper, handwritten; (d) dried basil, handwritten



a) *b)*

Figure 3: The results for the expected quality (a) of spice and perceived legibility (b) of typeface

bility was found ($p > 0.05$), indicating that participants' evaluation of the legibility of spice name was not influenced by variations in background color and lettering. However, there was a significant (typeface vs. flavor) interaction, $F(1, 59) = 4.87$, $p < 0.05$, suggesting that the handwritten typeface was perceived as more legible on the packaging for dried basil ($M = 4.53$, $SD = 0.97$) than on the packaging for the red pepper ($M = 4.43$, $SD = 0.91$). This may be influenced by the specific characteristics of the letters used in the product name. The Croatian word "Sušeni" which refers to dried basil contains very distinctive letters in this particular typeface. The letter "š" especially stands out. On the other hand, the Croatian word "Crvena" which refers to red pepper contains a very decorative letter "C" which can be confused with "O", and the rounded letter "v" which can be easily confused with "u".

3.3.3 Correlation between legibility and expected quality

The Spearman correlation analysis was performed to evaluate the association between legibility and the expected quality of spice. The Spearman correlation coefficient r_s was 0.458, indicating that better legibility ratings were associated with better quality, and this relationship was significant ($p<0.001$). When data were split by participants' categorization into text-oriented ($n = 35$) and picture-oriented ($n = 25$) groups, the results revealed that this correlation was higher for the text-oriented participants ($r_s = 0.582$, $p<0.005$) than for the picture-oriented participants ($r_s = 0.304$, $p<0.005$).

3.3.4 The influence of typeface and flavor in selection tasks

For each packaging pair presented to the participants in the selection task, the McNemar's test was performed. The results showed a significant difference in the participants' selection of packaging for red pepper ($p < 0.005$), indicating that the red pepper in the packaging with the sans-serif typeface (70 %) was perceived to have a better quality than the red pepper in the packaging with the handwritten typeface (30 %). Additionally, there was a significant difference in the participants' selection of packaging for dried basil ($p < 0.001$), indicating that dried basil in the packaging with the sans-serif typeface (75 %) was perceived to have a better quality than the dried basil in the packaging with the handwritten typeface (25 %). The obtained results are in contrast with the findings reported by Otterbring, et al. (2022) which suggested that the typeface did not have a direct impact on the participants' food choices. However, given that their findings are based on different typefaces and presentation context, the conclusions regarding the discrepancy with our results should therefore be treated with caution. There was no significant difference in the participants' choices when data were grouped by flavor ($p > 0.05$).

3.3.5 Participants' comments

Qualitative coding was done by an inductive approach and the category codes were derived from the overview of all participants' answers. All the reasons that were reported by the participants while justifying their selection of the spice packaging were grouped into three categories: "Excellent legibility of the product name", "Professional visual design of the packaging" and "Association between the typeface and the product type" (Table 4).

For example, if a participant explained the reasons for his/her choice by saying "The font seems to be appropriate for a natural product for cooking" that answer was categorized as "Association between the typeface and the product type". If a participant commented "This packaging looks very modern" that answer was categorized as "Professional visual design of the packaging". If a participant commented "I can easily read the information on the packaging, which gives me an impression of a good product" that answer was categorized as "Excellent legibility of the product name". The most frequently mentioned reasons for selecting the spice in the packaging with the sans-serif typeface fell into the category "Excellent legibility of the product name" ($n = 63$), followed by "Professional visual design of the packaging" ($n = 24$).

Table 4: Participants' reasons for their choices of packaging (n presents the number of mentions)

	Excellent legibility of the product name	**Professional visual design of the packaging**	**Association between the typeface and the product type**
Selection of packaging with sans-serif typeface			
Red pepper	$n = 31$	$n = 11$	$n = 0$
Dried basil	$n = 32$	$n = 13$	$n = 0$
Selection of packaging with handwritten typeface			
Red pepper	$n = 0$	$n = 7$	$n = 11$
Dried basil	$n = 0$	$n = 8$	$n = 7$

For the packaging with the handwritten typeface, the most frequently mentioned explanations for selection were: "Association between the typeface and the product type" ($n = 18$), followed by "Professional visual design of the packaging" ($n = 15$). This suggests that people do pay attention to the typeface on the packaging and that the typeface connotative aspect is appreciated, but good legibility is sometimes more relevant for the product choice. The high number of comments referring to excellent legibility of the sans-serif typeface is in accordance with the results of our correlation analysis which showed a high connection between the legibility of the spice name and the expected quality of the spice.

4. General discussion

The results of both experiments showed that the typeface influenced the participants' choices and their expectations of product quality. Experiment I revealed that the effect of the typeface depends on the presence of the ingredient depiction on the packaging, while Experiment II demonstrated that the majority of the participants based their quality expectations on the legibility of the product name.

In the first experiment we employed an online questionnaire which provided a sufficient number of responses and relevant data based on which Experiment II was designed. The main finding of the first experiment was that the typeface affected the participants' choices only when the packaging presented an image of the ingredient. As confirmed in previous research (Timmerman and Piqueras-Fiszman, 2019; Lidón, et al., 2018), ingredient depiction can play a significant role in consumers' impressions. Our results indicate that its effect can stimulate a positive perception of the sanserif typeface when forming expectations regarding spice quality. However, the results cannot be generalized because typefaces used in our experiment did not influence the choices for the participants who never buy spices. Although the percentage of that group was quite small (9.7 %), the result suggests that the participants' buying behaviour should be taken into consideration when investigating the effects of typeface in food packaging design.

Another important finding was the result of the general selection task. Among all the packaging variants used in the experiment, most of the participants selected the packaging with the photo depiction of spice. It is known that product imagery presented on the package can help consumers get information on the product (Simmonds, Woods and Spence, 2018; Purnhagen, van Herpen and van Kleef, 2016) and some of them use it to predict what the product would taste like (Simmonds and Spence, 2017). Thus, it is not surprising that realistic imagery can be especially beneficial for them. The power of realistic depiction was demonstrated in previous work by Abrams, Evans and Duff (2015) who reported that visual realism on food packaging was associated with healthier food. Earlier study by Ampuero and Vila (2006) revealed that people associated photographs with upper class products, while illustrations were a signal of accessible products. Still, in some circumstances the illustrations can be more effective than photographs (Septianto, Kemper and Paramita, 2019), at least when a designer wants to promote an organic food product.

The results of our second experiment excluded the effect of flavor on the participants' responses, confirmed the findings from the first experiment and revealed more data explaining the participants' preferences for the sanserif typeface. According to the participants' subjective ratings, spice in the packaging with the sanserif typeface was expected to be better in quality than the spice in the packaging with the handwritten typeface. The same was found of the perceived legibility of the product name on the packaging, indicating that the sanserif typeface (i.e., Arial) was perceived as more legible than the handwritten one (i.e., Brush Script MT).

These results are consistent with previous research that measured legibility of the Arial typeface more directly than our study. For example, Možina, et al. (2020) measured reading time for Arial and Times on different types of paper and found that text in Arial was read faster and with higher accuracy. The better legibility for Arial was also reported by Ko (2017) who measured legibility scores for Arial and Times New Roman on-screen.

Our further correlation analysis showed that better legibility ratings were associated with better quality of spice, especially for the text-oriented participants. This shows how important the typeface functionality is to consumers when examining packaging visual cues in the spice evaluation process.

Previous research also confirms the positive effect of easy-to-read typefaces in other contexts, such as increasing the attractiveness of a tour (Huang, Wu and Shi, 2018) or indicating the credibility of an online costumer review (Huang, et al., 2018). Our results indicate that the relationship between ease of reading and positive customer evaluation can also be manifested in food marketing, at least in the case of specific food products such as spice.

When it comes to the qualitative part of our study, we noticed a high congruence between the participants' verbal responses and their evaluation ratings. The comments given by the participants during the selection tasks supported these conclusions in regards to the connection between good legibility and positive impressions of spice quality.

The most frequently mentioned reasons for choosing the spice in the packaging with the sans-serif typeface referred to the excellent legibility of the spice name. On the other hand, for the packaging with the handwritten typeface, the participants mostly mentioned the typeface connotations as an explanation for their selection. For example, one participant said that the handwritten style of text insinuates a homemade meal and the taste of traditional quality food. This result is in line with previous studies which reported on the influence of specific visual properties of stimuli on consumer associations (Marques da Rosa, Spence and Miletto Tonetto, 2019) and sensory expectations (Gil-Pérez, et al., 2019). Still, the remarkably greater number of participants in our study based their spice selection on legibility (n = 63) rather than on the product–typeface association (n = 18). This implies that the consumers' personal mental association should definitely be taken into consideration when developing graphic design for food packaging, but understanding the effects of the parameters which make food names legible could also be used as an aid for a successful marketing strategy.

5. Conclusion

Our study showed that a legible typeface can be a useful tool for encouraging food product selection and conveying the message of product quality. When asked to choose the spice with a better perceived quality, based only on the packaging visual design, the participants preferred the one with the sans-serif typeface. Even changes in the experimental procedure or spice flavor did not weaken this effect. The findings contribute to the relevant evidence-based literature that offers practical guidelines for graphic designers, packaging producers and food marketers. However, our study has limitations. Firstly, the packaging samples were presented on-screen. This presentation mode has its benefits (such as low cost, simplicity and the ease of controlling the viewing conditions), but the disadvantage is the lack of physical contact with the product which would bring the experimental procedure closer to a realistic context. Another limitation was a small number of typeface variants used in the experiments. Although special effort was put into the appropriate selection of the two typefaces for the investigation, and their usage was well-established in past research, inclusion of a larger number of typefaces could offer a deeper knowledge about the associations between typography and consumer perception of food products.

Despite the limitations, our study demonstrated the powerful role of typeface in food packaging. Future studies could contribute to better understanding of its impact by investigating its interaction with other visual elements omitted in this study, such as transparent windows, graphic symbols and patterns. Following the recommendations provided by the legislation relevant to nutrition and foods regarding information clarity, as well as the significance of the effects of the typeface legibility suggested by our results, future studies should also examine typeface effects on other product related information, which can be voluntary printed on packaging for spices, such as alternative product description, storage recommendations and instructions for use. Regarding the hedonic aspect of food products, it would also be valuable to measure to which extent typeface aesthetics and functional properties may affect consumers' sensory expectations or, perhaps even more important, their real taste experience.

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