



How material, visual and verbal cues on packaging influence consumer expectations and willingness to buy: The case of crisps (potato chips) in Spain



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ABSTRACT

This paper analyses the influence that certain aspects of packaging design have on the consumer expectations of a series of sensory and non-sensory attributes and on willingness to buy for a bag of crisps in Spain. A two-part experiment was conducted in which 174 people evaluated the attributes for different stimuli using an online survey. In the first part, four stimuli were created in which two factors were varied: the packaging material and the image displayed. Interaction was identified between both factors for the attributes *Crunchy*, *High quality* and *Artisan*. For the attributes *Salty*, *Crunchy* and *Willingness to buy*, the image was the only significant factor, with the image displaying crisps ready for consumption being the only one that obtained higher scores. For the attribute *Intense flavour*, no statistically significant differences were identified among the stimuli. In general terms, the image displayed on the bag had a greater influence than the material from which the bag was made. In the second part, an analysis was made of the most effective way (visual cues versus verbal cues) to transmit the information that the crisps were fried in olive oil. To this end, two stimuli were designed: one displaying an image of an oil cruet and another with an allusive text. For all the attributes (*Intense flavour*, *Crunchy*, *Artisan*, *High quality*, *Healthy* and *Willingness to buy*), higher scores were obtained with the image than with the text. These results have important implications for crisps producers, marketers and packaging designers.

1. Introduction

During the process of designing a food package, the designer must make many decisions about the package's visual appearance. Studies conducted in recent years show that each of these decisions can influence the consumer's expectations of the product and their willingness to buy it, both individually and through interactions with other decisions made (Becker, van Rompay, Schifferstein, & Galetzka, 2011; Piqueras-Fiszman & Spence, 2011; Piqueras-Fiszman, Velasco, & Spence, 2012; Rebollar, Lidón, Serrano, Martín, & Fernández, 2012; Sundar & Noseworthy, 2014). Consumers' expectations are generated from their beliefs and their prior experiences as well as from a product's extrinsic aspects, such as the packaging's characteristics (see Deliza & MacFie, 1996; Piqueras-Fiszman & Spence, 2015 for reviews). In this context, the visual appearance of a product's packaging has an important role in generating consumer expectations and also modulates willingness to buy (see Deliza & MacFie, 1996; Piqueras-Fiszman & Spence, 2015 for reviews). Designers now have a great deal of

useful information to consider when designing packaging; however, this information is far from being complete and there are still some aspects of the visual appearance of packaging that remain largely unstudied. This is true for packaging material, the product image displayed on the front of the package and the relationship between visual and verbal cues.

Material is considered to be one of the elements that forms a part of the visual appearance of a packaging (Magnier & Schoormans, 2015). Studies thus far have observed that, just as other visually processed design elements, material has a capacity to influence the way in which consumers perceive the product and the ideas that they generate about its characteristics (Mutsikiwa & Marumbwa, 2013). However, in the field of perception, packaging material has been mainly studied from a perspective of haptic perception (i.e. information acquired through the hands) (Biggs, Juravle, & Spence, 2016; Chen, Barnes, Childs, Henson, & Shao, 2009; Krishna & Morrin, 2008; Piqueras-Fiszman & Spence, 2012; Schifferstein, Fenko, Desmet, Labbe, & Martin, 2013; Tu, Yang, & Ma, 2015), and the sensory transfer between touch and flavour (Spence, 2016). This body of

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knowledge suggests that packaging material may play a role in the generation of sensory expectations and willingness to buy, although this relationship has not been studied thus far. In this context, research conducted so far has mainly focused on the concepts of sustainability and naturalness. Labbe, Pineau, and Martin (2013) observed that touch and sight are the predominant senses used to evaluate the naturalness of a package of dehydrated soup, in a study that compared the use of different kinds of materials in a packaging. Magnier and Schoormans (2015) found that using a sustainable material positively influences the perceived ethicality of the brand and increases willingness to buy, particularly when the sustainability is visibly showcased. In an earlier study, the same researchers found that consumers perceived a package of raisins made from recycled cardboard to be more sustainable than one made from white plastic (Magnier, Schoormans, & Mugge, 2016).

The product image displayed on the front of a large proportion of food packages is another key element in its visual appearance (Ampuero & Vila, 2006; Liao, Corsi, Chrysochou, & Lockshin, 2015; Rebollar, Lidón, Martín, & Puebla, 2015). It is also one of the graphic elements that gives graphic designers most possibilities in terms of aesthetics as well as communication, and it tends to occupy an important space in the composition. For consumers, it is particularly important since it lets them know about the visual aspect of the product before buying it, making it a key element in the creation of expectations (Jaeger & MacFie, 2001; Underwood & Klein, 2002). The consumer's response depends on the characteristics of the image as well as whether it is an illustration or a photography (Deliza, Macfie, & Hedderley, 2003; Smith, Barratt, & Selsøe Sørensen, 2015), its size (Neyens, Aerts, & Smits, 2015), the quantity of product units displayed (Madzharov & Block, 2010) and the product used as a serving suggestion (Rebollar et al., 2016). However, in practice the designer very frequently chooses from a selection of different images of the product in which the main variation is the way in which it is represented (e.g. cut or whole, raw or ready for consumption). Few studies have used the way in which the product is represented in the image as a design variable (Kobayashi & de Benassi, 2015; Machiels & Karnal, 2016), although it seems reasonable to think that the different ways of representing the product will generate different responses in the consumer in terms of their sensory and non-sensory expectations and willingness to buy. However, this effect is yet to be further studied.

Moreover, while designing a packaging, the designer may use verbal or visual cues to communicate a message or an idea (Kauppinen-Räsänen, Owusu, & Abeeku Bamfo, 2012; Machiels & Karnal, 2016). The benefits of opting to use one over the other have been studied earlier in the fields of advertising and preventive medicine (Hammond et al., 2007; Jaeger & MacFie, 2001; Maynard, Munafò, & Leonards, 2013; Phillips, 2000; Rayner, Rotello, Stewart, Keir, & Duffy, 2001; van Rompay & Veltkamp, 2014). Visual and verbal cues produce different consumer responses and require different levels of cognitive processing (Kauppinen-Räsänen et al., 2012). Studies conducted thus far demonstrate that visual cues produce a higher vividness effect and require a type of unconscious and unintentional processing, while verbal cues require a higher level of cognitive effort (Mueller, Lockshin, & Louviere, 2009; Underwood & Klein, 2002). Visual cues attract the consumer's attention at point of sale (Honea & Horsky, 2012; Silayoi & Speece, 2007; Venter, van der Merwe, de Beer, Kempen, & Bosman, 2011) and their use enables consumers to generate expectations more quickly than through reading a text (Underwood & Klein, 2002). Nevertheless, designers should not underestimate the impact of transmitting information through verbal cues (Machiels & Karnal, 2016; Orth & Marchi, 2007). The influence of text and words on the way in which a food product is perceived and experienced has attracted great interest (Okamoto et al., 2009; Spence & Piqueras-Fiszman, 2014; Yeomans, Chambers, Blumenthal, & Blake, 2008), and it has been found that expectations generated by a product depend largely on the textual information displayed (Grabenhorst, Rolls, & Bilderbeck, 2008; Lähteenmäki et al., 2010; Liem, Toraman Aydin, & Zandstra, 2012; Siret & Issanchou, 2000; Sütterlin & Siegrist,

2015). However, it is not easy for a designer to apply this knowledge. The real problems designers face are very complex: often they have to communicate several messages in different hierarchies through one product packaging. In the case of a bag of crisps fried in olive oil, the designer must communicate the main message (crisps) and also a secondary one (with olive oil). Both messages can be communicated through visual cues, verbal cues, or through a combination of both. On commercial packaging, in most cases the main message (crisps) is communicated through both visual cues (an image of crisps) as well as verbal cues (the word "crisps"). However, it is not clear which is the most effective way to communicate the secondary message (that they have been prepared with olive oil). It is not easy to know the impact this decision will have on consumer expectations and willingness to buy, and the simultaneous nature of the stimuli means extracting valid conclusions from the studies conducted thus far is a complex task.

Owing to all the above, we expect that the modification of any of these three factors (i.e. the packaging material, the product image displayed or the use of visual or verbal cues to communicate additional information) will produce an effect on the consumer's sensory and non-sensory expectations as well as on willingness to buy. In summary, the specific aims of the present study were to analyse how the following factors of a bag of crisps: 1) the packaging material; 2) the way in which the product is represented in the image displayed on the packaging; and 3) the use of visual or verbal cues to communicate additional product information; affect consumer expectation for certain sensory and non-sensory attributes and the willingness to buy the product.

2. Materials and methods

2.1. Participants

One hundred and eighty-two persons participated in this investigation; eight of these were excluded because they did not complete the survey and were not included in the results. As such, one hundred and seventy four (approximately 51% female and 49% male, 18–61 years old, mean age of 27.6 (± 12.3) years) participants were considered.

With regard to their educational profile, approximately 64% of participants stated they had university qualifications, 35% stated they had qualifications from non-university institutions, and 1% said they had no professional qualifications.

With respect to the consumption of crisps, 13.8% stated they consumed them frequently (at least once a week), 64.9% answered from time to time (at least once a month), 20.1% said that they rarely ate them (less than once a month), and the remaining 1.1% admitted never having consumed crisps.

2.2. Procedure

The experiment was conducted via social media on a voluntary and anonymous basis, using an online survey tool to gather the data: SurveyMonkey®. Participants were not set a time limit to complete the survey or any particular section thereof. They were shown photorealistic renderings of six (4 in the first part and 2 in the second one) different crisps packages created for this investigation and given a survey to evaluate them. These stimuli were created using Photoshop CS5 (Adobe Systems Inc., San Jose, CA, U.S.A.) and Keyshot 4 (Luxion Inc., Tustin, CA, U.S.A.). All participants viewed the same packages displayed sequentially in a random order, so a within-subject experimental design was used.

2.3. Stimuli

A market study was carried out prior to the design of the stimuli to know the most frequent characteristics of the packages of potato chips sold in the Spanish market. The experiment was conducted in two separate parts.



Fig. 1. Visual stimuli used in part I of the investigation.

In part I, four crisps packages were designed in which only two factors were modified: the packaging material (*Material*) and the main image shown on it (*Image*) in order to evaluate the contribution of these two design factors to consumer expectations about sensory and non-sensory attributes and willingness to buy (see Fig. 1 and Table 1). For the material finish, it was decided to use two levels: one bag had a matt finish and the other had a shiny metallic finish. From now on these two levels will be simplified as “Paper” and “Metallized” respectively. Likewise, two levels were also used for the main image. On the first, a small pile of loose crisps was shown ready for consumption. On the second, there was a picture showing the process of transforming uncooked potatoes into crisps. From now on these two levels will be simplified as “Ready” and “In Process”. Both methods of representation are frequently used by commercial brands on the Spanish market.

In part II of the experiment, two packages of crisps (see Fig. 2) were prepared to study the effect of the use of visual or verbal cues to communicate the additional information that they were fried in olive oil. The decision was made to design a pack of crisps using the image of an oil cruet as a part of the main image and another one including the text “with olive oil”. From now on these two levels will be simplified as “Visual” and “Verbal”. On both designs “Paper” material was used since it is the most frequently used in the packages of crisps in olive oil that are sold in Spain. A manipulation check was conducted in order to make sure that both stimuli had the same semantic meaning for Spanish consumers. Participants ($N = 17$, 19–59 years old, mean age of 31.1, $sd = 10.03$) were asked, with an open-ended question, to say what kind of crisps they thought were contained in the package that corresponded with the “Visual” stimuli. All participants said that the crisps had been fried or prepared with olive oil, confirming that for Spanish consumers both packages had the same semantic meaning.

The other elements on the packaging were identical in the six packages designed. The package shape was inspired by one of the most typical structures of real packages of crisps, the rectangular, 180 g flexible package. The sizes of the images used in both alternatives of the factor Image were similar. The image elements included the product description (the words “Patatas fritas”, crisps in Spanish), the brand



Fig. 2. Visual stimuli used in part II of the investigation.

Table 1
List of product attributes used in the experiment.

Product attributes		Willingness to buy
Sensory	Non-sensory	
Salty ^a	Artisan	Willingness to buy
Intense flavour	High quality	
Crunchy	Healthy ^b	

^a Only used in Part I.
^b Only used in Part II.

Crisp's (created especially for this investigation so that the participants could not deduce certain attributes of the products based on prior experiences with other brands), the nutritional information (identical on all packages) and the quantity of product contained (identical in all cases).

2.4. Measurements

The survey was divided into three sections: questions to characterize the participants (age, gender, education, and frequency of consumption), a survey to evaluate the packagings in part I of the experiment — stimuli in Fig. 1 — and a survey to evaluate the packagings in part II of the experiment — stimuli in Fig. 2. Table 1 shows the attributes used in the experiment.

For each package, a survey evaluated five attributes and the willingness to buy it. The attributes were chosen by a panel of experts, comprising three packaging designers and three manufacturers from the food industry. They were recruited from the city of Zaragoza where the study was conducted.

In part II of the experiment, the attribute *Healthy* was included and the attribute *Salty* was eliminated, since the panel of experts deemed this to fit in better with the objectives of this part of the experiment.

Participants were asked to evaluate the product attributes for each package according to a LIKERT scale of 1 (totally disagree) to 7 (totally agree). Participants were given the option of leaving the questionnaire blank for questions they did not know how to answer.

Willingness to buy was evaluated using the same scale of 1 (would not buy under any circumstances) to 7 (would be totally willing to buy).

Table 2

Results from linear mixed model. (F: F-value, M: Material; I: Image; df: degrees of freedom; $\hat{\sigma}^2$: Between-subject variance; $\hat{\sigma}^2$: Variance of error).

Attributes	$\hat{\sigma}^2$	$\hat{\sigma}^2$	F _M (df = 1;519)	p-value	F _I (df = 1;519)	p-value	F _{MxI} (df = 1;519)	p-Value
<i>Salty</i>	1.08	1.20	0.900	0.343	6.522	0.011	0.261	0.601
<i>Intense flavour</i>	0.91	1.28	0.040	0.843	0.014	0.905	0.128	0.721
<i>Crunchy</i>	1.04	1.55	1.320	0.249	19.597	< 0.001	3.057	0.081
<i>Artisan</i>	1.38	1.69	4.010	0.046	3.038	0.082	4.005	0.046
<i>High quality</i>	1.12	1.49	6.654	0.010	0.252	0.616	4.318	0.038
<i>Willingness to buy</i>	0.89	1.81	2.325	0.128	16.099	< 0.001	2.086	0.149

It was specified in the survey that all the products contained the same quantity of crisps and had the same price.

2.5. Data analysis

A linear mixed model (Verbeke & Molenberghs, 2009) was conducted to analyse whether there would be differences between the fixed factors: Material, Image and the interaction between both factors. The subjects (participants) were included in the model as a random factor. This analysis design was chosen because as the four crisp packages were assessed by each subject, these measurements are likely to be highly correlated for any individual participant. When interaction is observed between the two factors, the interpretation of the main effects is compromised since the impact of one factor depends on the level of the other factor. The levels of the factors were therefore concatenated to analyse the interaction and a linear mixed model was conducted with a fixed factor (Material x Image) and a random factor (subjects). The Bonferroni correction was also used. The second part of the experiment was analysed using a dependent t-test for paired samples. The significance level chosen was 0.05.

To study the preference of individuals with respect to the packages used in the first part of the experiment (Material factor and Image factor), the Individual Differences Model was used (Carroll & Chang, 1970; Horan, 1969). This technique is included within multi-dimensional scaling techniques and is also known as INDSCAL. In this study, a matrix (4 × 5) of similarities between packages was calculated for each individual. These similarities were obtained from each individual score given to the different packages of crisps in relation to its sensory and non-sensory attributes. This technique allows the creation of a space of consensus for the individuals showing the similarities between the packages of crisps. In addition, it is possible to find out the weighting that each individual gave to the dimensions obtained in the consensus space. The weightings reflect the importance that the individuals associate to the dimensions in the stimuli space. Although one person can perceive one of the dimensions to be more important than the other, another person can have the opposite perception.

This technique was used with the attributes (sensory and non-sensory), as well as with willingness to buy. The analysis was conducted using the PROXCAL algorithm (Leeuw & Heiser, 1980), and Euclidian distance was used as a measure of similarity. The criterion to choose the number of dimensions in the consensus space was based on goodness of fit and the number of stimuli included in the analysis. S-Stress was used to determine goodness of fit. If this measurement is low, it indicates that the configuration obtained in the map (or space) is good. Although there is no strict rule regarding how much stress is tolerable, the rule of thumb is that a value ≤ 0.1 is good and anything ≥ 0.15 is not tolerable (Kruskal & Wish, 1984).

The vector model (Schiffman, Reynolds, & Young, 1981) was used to interpret the dimensions of preference in accordance with the observable attributes. This procedure uses the multiple regression technique to determine the direction of the attributes. The means of the individual scores of attributes are used to calculate the multiple regression, and the standardized regression coefficients (β₁, β₂) are computed and drawn as coordinates in the two-dimensional stimulus plane. Finally, a

line is drawn through the origin of the stimulus consensus space and through coordinates defined by the regression coefficients.

This model allowed the packages to be ordered according to each of the attributes evaluated by the subjects. It also made it possible to determine which attributes had a high correlation in the stimuli evaluation. The data was processed and analysed using SPSS Statistics 23 (Armonk, NY, U.S.A.).

3. Results

3.1. Part I: effect(s) of package material and image

Part I of the experiment studied the influence of two factors, the bag's material and the image of the product displayed on the bag, on a series of sensory and non-sensory attributes and on willingness to buy the product.

Statistically significant differences were obtained for five of the six attributes studied (Table 2). The attribute *Intense flavour* was the only attribute that was not statistically significant for any effect. The attributes *Salty*, *Crunchy* and *Willingness to buy* were only statistically significant for the factor Image, the difference in means between “Ready” and “In Process” were 0.201 (SE = 0.089), 0.341 (SE = 0.08) and 0.287 (SE = 0.085) respectively.

The rest of the attributes — *Artisan* and *High quality* — showed a statistically significant interaction among the factors. As this interaction was observed, the levels of both factors were concatenated. The results of the multiple comparison analysis for each attribute can be seen in Table 3. Significant differences were identified for the attributes *Artisan* and *High quality*, between 1 (“Paper”-“Ready”) and 3 (“Metallized”-“Ready”).

The consensus plane obtained by analysing individual differences (Fig. 3) shows similarities among the stimuli. The dimensionality chosen for the multidimensional scaling solution was two dimensions (S-Stress = 0.05). Dimension I differentiates the packages with different images. Dimension II differentiates the packages with different materials. An analysis of the layout of the packages in relation to the attributes included using the vectorial model shows that the attributes *Salty*, *Crunchy* and *Willingness to buy* are closely associated with Dimension I but are much less related to Dimension II. The attribute *Artisan* is equally associated with both dimensions. *High quality* is

Table 3

Multiple comparisons based on the concatenation of factors (Material and Image). P-R: Paper-Ready; P-IP: Paper-In Process; Mt-R: Metallized-Ready; Mt-IP: Metallized-in Process; DM: difference of means; SE: Standard Error.

		<i>Artisan</i>			<i>High quality</i>		
		DM	SE	p-value	DM	SE	p-value
P-R	P-IP	0.023	0.119	1.000	0.207	0.115	0.412
	Mt-R	0.356	0.114	0.029	0.374	0.104	0.006
	Mt-IP	0.023	0.130	1.000	0.247	0.117	0.179
P-IP	Mt-R	0.333	0.130	0.05	0.167	0.118	0.854
	Mt-IP	0.000	0.113	1.000	0.040	0.106	1.000
Mt-R	Mt-IP	- 0.333	0.146	0.05	- 0.126	0.118	0.174

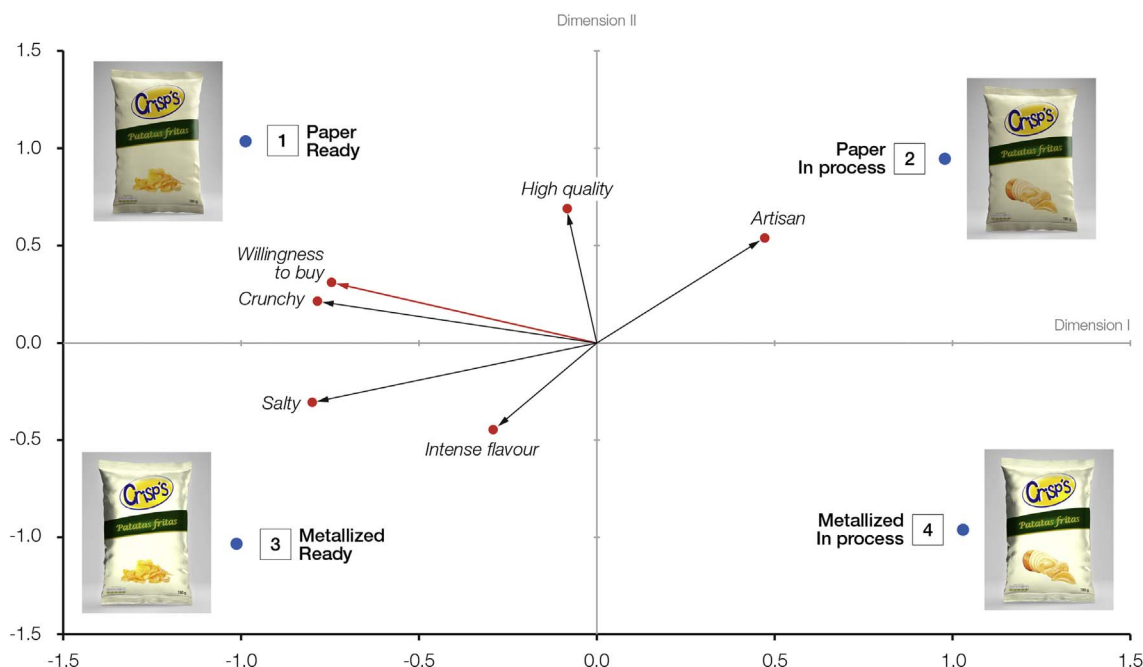


Fig. 3. Two dimensional consensus space for the stimuli (crisps packages).

mainly associated with Dimension II, although this association is non-significant, and *Intense flavour* displays weak associations with both dimensions.

It can be seen how *Willingness to buy* has a strong positive relationship with the attribute *Crunchy*.

The attribute *High quality* displays a weaker relationship with *Willingness to buy* although this result must be interpreted with caution as the association of the attribute *High quality* with the two factors on the plane was not statistically significant.

The analysis of subjects' weightings in each dimension shows that 20% of individuals gave more importance to Dimension I, and only 7% gave more importance to Dimension II. Most subjects (73%) gave similar weightings to each dimension.

3.2. Part II: effect(s) of package additional information

With reference to part II of this experiment, which seeks to investigate how users' perception is influenced by the crisps being fried in olive oil — either by means of the image of an oil cruet (“Visual”) or by a text (“Verbal”) — the data were analysed by comparing the paired differences between the mean scores of the attributes when the image or the text was presented by means of a *t*-test (Table 4). As can be seen, all the attributes obtained a higher score for the “Visual” stimuli than for the “Verbal” stimuli.

Table 4
t-Test for paired data of the difference between “Visual” and “Verbal”.

Attributes	Difference of means “Visual” – “Verbal”	Sample size	<i>t</i> -Test	<i>p</i> -Value
<i>Crunchy</i>	0.247	174	3.060	0.002
<i>Artisan</i>	0.656	174	6.422	< 0.001
<i>High quality</i>	0.506	174	4.910	< 0.001
<i>Intense flavour</i>	0.437	174	4.804	< 0.001
<i>Healthy</i>	0.437	174	4.460	< 0.001
<i>Willingness to buy</i>	0.529	174	5.216	< 0.001

4. Discussion

This investigation had the aim of studying the way in which the product is represented on the packaging image, the effectiveness of the use of either visual or verbal cues to transmit a secondary message, and how the packaging material affects consumer expectations of the product and their willingness to buy. A bag of crisps was used and the results show that the three design factors studied — Material, Image and the way Additional Information is presented — all have an effect on some of the attributes evaluated.

4.1. Part I: effect(s) of package material and image

The aim of the first part of the experiment was to analyse the effect of factors Image (“Ready”, “In Process”) and Material (“Paper”, “Metallized”) on the evaluation of some sensory and non-sensory attributes and on *Willingness to buy*. The results of the ANOVA conducted show that there is an interaction between the Image and Material factors for some of the attributes evaluated, which is consistent with the idea of Orth and Malkewitz (2008) that consumers evaluate packaging holistically and not as the sum of the characteristics of each of its elements. In the cases where there is no interaction, the attributes *Salty* and *Crunchy* and the *Willingness to buy*, the effect of factor Image is stronger than that of Material since the differences between the evaluation of the levels “Paper” and “Metallized” are not statistically significant.

With regard to the factor Image, the “Ready” image obtained higher scores than the “In Process” image for both the attributes *Salty* and *Crunchy* as well as for *Willingness to buy*. These results can be explained by the fact that the consumer uses the appearance of the product to infer its sensory attributes (Jaeger & MacFie, 2001). Therefore, displaying an image of crisps in their final state and ready for consumption allows the consumer to process their sensory characteristics more clearly than if the crisps are shown next to half of an uncooked potato. In addition, when the presentation of a target coincides with the consumer's mental representation of that target, processing fluency is lower, which leads to more positive evaluations (Chae & Hoegg, 2013). In this context, the crisps used for the “Ready” image are probably more similar to the consumer's mental representation of a crisp than the

image used for the “In Process” image. Regarding the attribute *Crunchy*, these results are also congruent with the visual preview model used in cognitive psychology (Klatzky, Lederman, & Matula, 1993). According to this model, viewing an object allows the observer to infer its haptic properties (Klatzky et al., 1993; Peck & Childers, 2003), which is very useful when assessing the crunchiness of a food (de Liz Pocztaruk et al., 2011; Duizer, 2001; Zampini & Spence, 2004). Thus the “Ready” image allows the consumer to more clearly infer the properties of the crisps because this image only shows crisps ready for consumption, which are crunchier than the uncooked potato slices shown in the “In Process” image. Furthermore, some studies suggest that viewing images of food increases hunger and salivation and that this, in turn, increases willingness to buy (Simmonds & Spence, 2016). However, there is an interaction between the Image and Material factors for the attributes *Artisan* and *High quality*, meaning their respective effects cannot be isolated.

The results of the MDS also help to understand the effects of factors Image and Material in those cases in which there is interaction. Thus it can be seen how the “In Process” image is closely related with the attribute *Artisan*, which may be owing to the fact that the image metaphorically shows the process of preparing crisps. The negative relationship between *Willingness to buy* and the attribute *Artisan* may possibly be owing to the higher price that traditionally prepared crisps tend to have on the market. With respect to factor Material, the MDS shows that the visual aspect of the packaging material has an effect on the evaluation of the *High quality* attribute. Magnier et al. (2016) showed that the material used for a food packaging can affect the way that consumers evaluate its sustainability, and can also affect their evaluation of intrinsic product attributes, such as quality. Therefore, packaging with a paper appearance may seem to be of a higher quality than packaging with a metallic aspect. Thus the consumer may subconsciously project the evaluation of that attribute onto the product itself due to the halo effect (Nisbett & Wilson, 1977), which helps to explain why the “Paper” packaging scores were higher for the *High quality* attribute. Nevertheless, the cause for this association between “Paper” and *High quality* is not clear. It is possible that this association exists because the consumer deems that the material is intrinsically higher quality than the “Metallized” material. Another possible explanation may be found in the code established in this market, since, as we observed in the market analysis prior to this study, crisps sold in packaging with a paper-like appearance tend to be more expensive than those sold in metallized packaging.

4.2. Part II: effect(s) of package additional information

In the second part of the experiment, the effect of the additional information factor (“Visual” – “Verbal”) was analysed in the evaluation of some sensory and non-sensory attributes and on *Willingness to buy*. The packaging corresponding to the “Visual” level (the one displaying the image of an oil cruet) obtained higher scores for all the attributes evaluated than the packaging corresponding to the “Verbal” level (in which the text “with olive oil” was displayed). These results are consistent with earlier studies that observed that visual information is believed to be more powerful than verbal information (McQuarrie & Mick, 2003; McQuarrie & Phillips, 2005). In this context, Sehrawet and Kundu (2007) demonstrated that for a low-involvement product, such as a bag of crisps, the use of visual cues allows the transmission of information in less time and with less effort than verbal cues because of the effort involved in processing a text. This lower processing fluency could therefore favor greater acceptance of the product (Chae & Hoegg, 2013). From an attention perspective, it is even possible that there are people who have not paid attention to the text. According to the findings of Rebollar et al. (2015), the larger relative size of the image of the potatoes with respect to the text on the packaging corresponding to the “Verbal” stimulus may have led to this cue having attracted the attention of the consumer, meaning that the text may have gone unnoticed. Despite this possible

effect, the relative difference of sizes between the image of the crisps and the text was maintained to guarantee the realism of the stimuli and therefore be able to extrapolate these results to a realistic design case study.

It is important to underscore that the two packages corresponding to the additional information factor already display a visual cue (the product image). Our results indicate that, if together with that cue, the aim is to communicate the secondary message that the product has been prepared with olive oil, which is of interest for the consumer (López-Miranda et al., 2010), doing this through “Verbal” cues may not be a good idea because the stronger impact of the product image means that the textual message goes unnoticed. However, by communicating this message through an image, the consumer processes the message more quickly in its entirety by perceiving it as a single visual cue. This kind of crisp may be considered to be superior to standard ones, as such a higher evaluation of all the attributes studied may be expected (*Intense flavour, Crunchy, Artisan, High quality, Healthy and Willingness to buy*). This was true in both cases, with the scores where the image was displayed being higher than those where the text was displayed.

4.3. Limitations and future research

With respect to the stimuli, it's possible that some of the participants didn't appreciate the difference in the packaging material design variable. In the stimuli design stage, care was taken to ensure that the metallized finish was much more shiny than the matt finish chosen for the paper finish, and photorealistic renderings were used for the creation of the stimuli used. In addition, before starting the survey it was indicated that some of the packages that were going to be evaluated were paper or metallized and any of the conventional mediums used by the participants (PCs, smartphones, tablets...) have a high resolution. However it can't be ruled out that the effect of the material on the results of the study was much less significant owing to this circumstance.

The similarity of the images used in this study (“Ready” and “In Process”) with those of existing brands may have influenced the scoring of certain attributes, since the images could have brought to mind experiences and sensations produced when previously consuming those brands. Nonetheless, to try to avoid this interference a neutral design was used in which other packaging design variables — such as colour, lettering and brand name — differed greatly from those of real brands.

The sample of consumers who participated in this study is biased concerning education, given that almost two thirds (63.8%) stated they held university qualifications. Similarly, 21% of the participants stated that they were not regular consumers of the product. Consequently there are limitations with respect to the participants' diversity and characteristics, meaning that further testing would be needed to see if these results can be extrapolated to the general public.

In future lines of research, it would be interesting to further investigate into the relationship between the packaging material and the sensory attributes of the product. The results obtained in this paper indicate that the influence of the material is concealed by the strong effect of the main image on the packaging. Nevertheless, there are some interesting results that are worthy of a more comprehensive study. In this sense, this research could be extended with a tasting of the product in which the participant could physically interact with the packaging to ensure that the differences in the material of the stimuli are perceived and thus test whether the results obtained are extrapolated in a tasting setting. In addition to the different stimuli used in this experiment, a blinded tasting could be added in which only the intrinsic properties of the product were evaluated, since previous studies have proved reported consumer experience changes in blind (i.e. without seeing the packaging) and package (i.e. seeing the packaging) conditions (Chaya, Pacoud, Ng, Fenton, & Hort, 2015; Hersleth, Monteleone, Segtnan, & Næs, 2015; Ng, Chaya, & Hort, 2013).

Furthermore, and also motivated by the greater importance of the oil cruet in part II of the experiment, it could be interesting to explore

the option of using visual or verbal cues to transmit secondary messages in contexts in which there is no main image, or when the secondary message to be transmitted does not have a mainly positive implication for the consumer (e.g. to communicate sensory properties like flavour and aroma).

Moreover, although this paper has not identified differences between the results obtained in terms of gender, age or level of education of the participants, it would be interesting to explore other associations, such as whether or not there are intercultural differences when assessing the design variables and attributes that have been analysed in this paper, in line with papers such as that of Piqueras-Fiszman et al. (2012).

5. Conclusion

This research shows that some design decisions can influence consumer expectations about the product even before purchasing it. Therefore the way in which the product is represented in the image displayed on a bag of crisps influences consumer perception. Of particular interest is the fact that when the image shows crisps that are ready for consumption, willingness to buy is higher than when the image shows the process of transforming uncooked potatoes to crisps. The material used for the bag of crisps also influences consumer perception, although less so than the product image. One of the main findings was that a bag with a paper surface finish obtained higher scores in relation to the attribute *High quality*. This experiment has demonstrated that, the fact that the crisps are fried in olive oil is transmitted better through visual cues (displaying the image of an oil cruet) than via verbal cues (displaying the text “with olive oil”). The results presented in this paper highlight the importance of packaging on customer expectations and willingness to buy. These results are of interest to packaging designers and to manufacturers, marketers and professionals in the sector to provide information on the way in which the aspects related with the packaging influence the way in which consumers evaluate the product.

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